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UNITED SERVICE.

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THE ENGINEER CORPS OF THE UNITED STATES NAVY.

"Their names were counted on the day of battle; but they were overlooked in the division of the spoil."

(Continued from Vol. XI., page 518.)

PART II.

THE NAVAL ENGINEERS IN THE CIVIL WAR.

AT the beginning of the eventful year 1861 the engineer corps of the navy consisted of twenty-eight chief engineers, forty-three first assistant engineers, twenty-nine second assistant engineers, and ninety-two third assistants, a total of one hundred and ninety-two. This number was established by adhering as closely as practicable to the provisions of the act of Congress of 1842, which authorized the appointment of one chief engineer, two first assistants, two second assistants, and three third assistants for each steam-vessel of war. The steam navy at the beginning of 1861 consisted of seven great frigates, of which the "Niagara" and "Colorado" were types, and which in their size, battery, and beauty were the marvels of the maritime world of that day; six first-class screw sloops, every one of which was destined to become famous in the annals of the navy, and one of which—the "Hartford"—was to become a name synonymous with naval glory; four large side-wheel steamers, one of which was the "Powhatan;" eight second-class steam-sloops, represented in the modern navy by the "Iroquois;" five pur-

chased screw steamers of about five hundred tons each, and five small side-wheel gunboats, the "Michigan" of this class being still with us.

Twenty-seven of the members of the engineer corps were Virginians, and seven others belonged to the Carolinas, Alabama, and Florida, but the majority came from the New England and Middle States, Maryland and the District of Columbia being especially well represented. The Northwestern States, which now furnish so many naval engineers through the medium of the Naval Academy, then had but five representatives,—two each from Ohio and Wisconsin and one from Illinois. Mr. Samuel Archbold was the engineer-in-chief of the navy at the beginning of the year, but in March he resigned that position and his commission as a chief engineer in the navy as well, going out of the service without any suspicion of disloyalty, as his motives for resigning were personal and not connected in any way with the political unrest of the times. He was succeeded by Mr. Benjamin F. Isherwood, who was selected by the President and appointed engineer-in-chief on the 26th of March, 1861. Mr. Isherwood's name was the fifth in order on the list of chief engineers at the time, and he was recognized as the foremost man of his corps in professional ability and zeal, while his indefatigable energy and intense patriotism brought to the head of one of the most important executive branches of the Navy Department a man well fitted for the Herculean task that the next few years had in store.

In the spring of this year the political storm that had been gathering for so many years finally burst, and the officers and men of the navy were confronted with the desperate issue of choosing between two flags. Of the engineers from the Southern States, four resigned and had their resignations accepted by the Department, but by that time resignations of officers of the army and navy had become epidemic, and President Lincoln directed that all such in the future be treated as proof of disloyalty sufficient to warrant summary dismissal from the service of the United States, which treatment was administered to seventeen of the naval engineers who sent in their resignations after it was too late. One of these, William P. Williamson, whose name had stood at the head of the list of chief engineers, became the engineer-in-chief of the Confederate navy; a few others continued their profession in the same service, while others went into the insurgent army, where some achieved considerable military distinction, and others were killed or crippled fighting against the flag under which they had acquired their first military ideas, and to which they would have remained loyal had they been inspired by that thoughtful good judgment supposed to be an attribute of all engineers by virtue of the philosophic nature of their calling.

In July, 1861, Congress provided for a temporary increase of the navy "for and during the present insurrection," which act authorized

the Secretary of the Navy to hire, purchase, or contract for such vessels as might be found necessary, to arm and equip them, and to appoint acting or volunteer officers for them. Under the operation of this law the navy grew rapidly both in ships and in *personnel:* such vessels as were bought outright or built on the order of the Navy Department became, of course, government war-vessels, and as such served to authorize a great increase in the regular engineer corps, a considerable increase being effected during the first year of the war, but not at all in proportion to the increase in the number of war-steamers, as the officials in the Navy Department were wise enough to know that the rebellion would eventually be put down, and that it was only a question of time before the navy would have to be re-established on a peace basis. Accordingly the majority of the new engineers held only acting appointments. At the end of the year 1861 the regular engineer establishment had increased to four hundred and four, of whom forty-eight were chief engineers; at the same time there were three hundred and sixty-four acting engineers distributed through the grades of first, second, and third assistants. The increase in numbers went steadily on until, in January, 1865, there were four hundred and seventy-four regulars and eighteen hundred and three volunteers, of which numbers fifty-nine regulars and fifty-five volunteers were chief engineers.

It is interesting to note in connection with the number of engineers in the navy at the beginning of the year 1865 that the total number of regulars and volunteers (two thousand two hundred and seventy-seven) was almost exactly two-thirds of the total number of line officers at the same time, that number being three thousand three hundred and ninety-one, in which I have included eight hundred and forty-one acting master's mates and one hundred and eleven boatswains and gunners, as these officers during the war were assigned to watch and division duties usually pertaining to commissioned officers of the line, just as the acting third assistant engineers fell into more responsible duties than their grade warranted.

As this ratio of line and engineer officers had been arrived at as the practical result of four years of active warfare, it may safely be assumed to be a proper and necessary one for carrying on war with steam-vessels, even though it is widely different from the theories of some of our amateur naval reformers who profess to think that one engineer to a ship is ample for all demands of duty; and this in spite of the fact that the war-vessel of the present day is much more of an engineer's machine than was the case during the Civil War period, when sails were still loyally adored as the emblem of the sea-officer's faith.

Another interesting fact connected with the growth of the engineer corps during the war period is that it was aided and encouraged by the line officers of the navy. There was then no lobbying against the

incoming of the engineers; no "memorials" addressed to Congress on the subject, and purporting to prove by means of intersecting curves or baking-powder diagrams that the navy already had more engineers per ship than was the case in the navy of Mesopotamia. On the contrary, when a line officer suddenly found himself in command of a ship of war with the privilege of honoring or disgracing his country, and incidentally himself, by his conduct with that ship, he very quickly realized that the efficiency and readiness of his command depended almost wholly upon the energy and ability of the engineers, and he fostered them accordingly. The constant demand of officers in command of fleets and squadrons was for more engineers for their ships, and I am told that when a supply or transport steamer appeared in a blockading squadron, the first question signaled was to ask how many engineers had been brought, after which there was time enough to ask for news from the army and the North.

The engineer officers of the regular service enjoyed this, for they had been hoping for years before the war that the time would come when they could demonstrate by their skill and courage in time of need the indispensable nature of their services, and now they thought the day of their vindication was at hand. It does not seem to have occurred to any of them that they would be allowed to go unthanked after bearing the heat and burden of the day for so long a time, and after their zeal and fidelity had made success and fame possible to scores of commanding officers, yet that is exactly what happened. When the long strife was finally over, and it became in order for the victors to divide the spoils, it happened, whether by accident or design is immaterial, that this important military arm of the naval service was wholly overlooked, and its members passed by without reward. Not only did they go unrewarded when promotions for other officers were being lavishly distributed, but they were actually degraded, as we shall presently see, from the rank that had been bestowed upon them during the war.

In spite of all the hurry, excitement, and anxiety incident to the existence of a state of war, it is greatly to the credit of the officials at the head of the engineer corps that the careful system of examinations for admission to the regular service was rigidly adhered to throughout the war, thus preventing the acquisition to the permanent corps of any who were not professionally and morally fit for the service. In the case of acting appointments in the volunteer service little or no examination was required, the need for engineers being so great that almost any one who could show a letter of recommendation from a commander or chief engineer of a war-vessel, or from a civilian of prominence, could get an acting appointment. The majority of the acting engineers were men who were really engineers, many of them being of recognized ability and reputation in their line, who entered

the service from motives of patriotism, and naturally chose the engineering branch of the navy in preference to wading through the mud, either with or without a sword, in the army.

As might be expected, however, and as often occurred in the other branches of the navy, numerous acting appointments were given to men who were utterly unqualified for the duties they were expected to perform on board a war-steamer. Adventurers who saw in the seven hundred and fifty dollars per annum of the "Acting Third" in the navy more attraction than was offered by thirteen dollars per month and found in the ranks of the Army of the Potomac; firemen recommended by their captains for some gallant or meritorious act; sons or friends of prominent military and civil officials; subalterns disgusted with the Chickahominy swamps, and many other classes too numerous to mention, all had their representatives in the volunteer engineer corps. As there were from four to ten engineers on each war-steamer in those days, the presence of one of these inexperienced persons was not very dangerous, as he was always under the eye of some one who was able to prevent disaster by interfering in case of necessity. When a number of them happened to get shuffled together, as sometimes occurred, and thus obliged to try to do something without being told how to do it, they generally came to grief, as is attested by innumerable tales in the service.

One of these stories relates to the wearing away of the valve faces and seats of the engines of the gunboat "Galena" on her first trip from Mystic, Connecticut, where she was built. She had three acting third assistant engineers hurriedly sent on board to bring her around to a navy-yard, their professional qualifications being as follows: the senior one, who consequently acted as chief engineer, had been for several years an excellent fireman in the navy, and had won the favor of his commanding officer by performing some especially gallant act in an emergency, for which he had been rewarded with a warrant as an acting engineer. He could neither read nor write, and, according to the tradition, was unable to tell the time by a clock, he having on one occasion been discovered in the act of scrutinizing the engine-room steam-gauge for information as to whether or not it was time to call the relief watch. The second one was a village schoolmaster from the up-country of New Hampshire, whose knowledge of marine engines had been obtained from a picture of a condensing engine in Olmstead's "Principles of Natural Philosophy," at that time a favorite text-book in the country schools of New England. The third one was a youth of about seventeen who had been the schoolmaster's favorite pupil in the New Hampshire village, and who had joined him in the enterprise of suppressing the rebellion through the medium of the naval engineer corps. All three of these "engineers" were much surprised when the material in the valves became exhausted and the engines

ceased to run, but the surprise was not general in the engineer corps.

Another incident which occurred about the same time was not the source of any great amount of delight to the acting engineers directly concerned. A war-steamer left New York for the seat of war one fine day, the commander and all hands indulging in high hopes of glory and prize-money. After a few hours at sea the engine suddenly stopped, and then began running backward at a furious rate; do what they would, and aided as they were by voluminous advice from the deck officers, the marines and others, the engineers could not coerce the engine into going ahead again, and finally the captain had to ignominiously abandon his cruise and take his ship, tail first, back to New York, an object of surprise and derision to the watermen of that busy seaport. The navy yard was reached in the course of time, where a few vigorous remarks from the chief engineer of the yard and about two minutes' work put everything to rights. The eccentric had slipped.

The acting engineers in this case were eminently "practical" men: they could "run" an engine with great skill so long as nothing unusual happened, but they did not have to know anything about valve diagrams or nonsense of that sort, and they had a virtuous contempt for the theoretical engineers who studied books and made pictures of the way the parts of an engine should be put together. They were in fact exactly the kind of practical mechanics that some of our naval reformers want to introduce into the navy to "drive" the engines of our modern high-powered war-vessels. The best cure for the reformers would be to put them in command of small vessels, of inconsiderable value, in the presence of an enemy's vessels of equal force, leaving their escape in this emergency to the knowledge of their "practical" engine-drivers.

The volunteer engineer who was not an engineer did not always get into trouble, as is shown by the successful experience of one Don Carlos Hasseltino, whose remarkable naval career is worthy of a little space in the history of the naval engineering of the rebellion. This gentleman was a native of the West Indies, but had graduated at a college in Ohio, and at the time of the outbreak of the war was reading law in Hamilton, Ohio. His sympathies being with the South, he went to Montgomery, Alabama, and entered the Confederate army, rising to the rank of lieutenant-colonel in about two years, when he fell into the hands of the enemy in the vicinity of Fort Donelson. Pretending to be a civilian and a foreigner, which he could easily do by his ability to speak French, he succeeded in getting a pass from the Union officer in command at Memphis, and went to St. Louis, not knowing just why he was going there or what he would do next.

In the streets of St. Louis he chanced to meet a former collegemate who was an assistant engineer on one of the gunboats in the

Mississippi River. This friend urged him to give up the Confederate cause and enter the navy as an engineer, to which proposal he demurred, as he said he "did not know a steam-engine from a horse-power," but his friend assured him that that did not make any difference. Accordingly, and knowing that he would probably be hanged as a spy if his connection with the South were discovered, he studied some of the assistant engineer's books for a few weeks and then presented himself to the authorities as a candidate for the engineer corps. He made such a good impression that he was given an acting appointment as a first assistant engineer, and was ordered to duty on the gunboat "Essex," then the flag-ship of Rear-Admiral D. D. Porter.

According to Mr. Hasseltino's account of himself, his great fear at this time was that the "Essex" would be ordered to get under way to go somewhere, and he would consequently be called upon to do something with the machinery, which he knew he could not do, his mechanical knowledge being yet so imperfect that he thought the feed-pump was a contrivance for making the vessel go sidewise. But luck was on his side, for he had opportunities to talk with Admiral Porter, and so impressed that distinguished officer with his professional worth that he was put on the admiral's staff and assigned to important special duty in connection with the building and inspection of ironclads at various points on the Mississippi River. A report made by him to the admiral respecting the value of certain types of ironclads for river service was considered so meritorious that the admiral embodied it in his report to the Secretary of the Navy, and that official in turn transmitted it to Congress in his annual report.

In May, 1864, after less than a year's service, Mr. Hasseltino was made an acting chief engineer, in which capacity he continued on duty with the Mississippi flotilla; two years later, in May, 1866, he was honorably mustered out of the service. Subsequently he acquired the title of general and considerable wealth by engaging in various wars in Chile, Peru, and Cuba, but with this we need not deal here. Acting Assistant Surgeon J. M. Batten has written an interesting little volume of reminiscences of his service in the navy during the war, in which book occurs the following account of the person whose versatile career I have been describing:

"Don Carlos Hasseltino was chief engineer of the United States monitor 'Catawba,' but spent most of his time on board the United States monitor 'Oneota,' and was one of the messmates of that vessel. I associated with him constantly from October 6, 1865, to January 16, 1866. He was a jolly, kind, sympathetic, and intelligent associate. In height he was about six feet, and had a large, wiry frame. His hair and eyes were black; he wore a black moustache. He never gave offense to any one, but would not suffer himself to be insulted. He carried two Derringers in leather pockets buttoned to his pantaloons

above the hips. He was very polite and chivalrous; woe to the person that gave offense or offered insult."

He must have been a charming playmate, indeed, to have in a crowded wardroom, judging by this description; still, there are some excellent traits of character indicated, and one cannot repress the feeling that if a few chief engineers of that ilk, "Derringers" and all, were judiciously distributed about the fleet now the effect upon man-of-war ethics might be beneficial. At any rate, a change either for better or worse would result from the experiment, and changes of any kind are usually hailed with delight, so frivolous and unstable are the dispositions of men in general.

Prior to the outbreak of the war sails had been regarded as the chief motor for war-vessels, such great vessels as the "Wabash" and "Niagara" even having steam only for auxiliary purposes to help in getting in and out of port or in crossing a calm belt. The engineer corps had consequently not risen to a position of sufficient importance to make itself an object of much jealousy in the service, and its members had not yet been brought face to face with the struggle for existence afterwards forced upon them as a direct result of the growing importance of their functions. Nor did the circumstances of service during the war develop any desire to belittle the services of the engineers by accusing them of being "civil adjuncts" or "non-combatants," it being left to the idle minds of a later generation in the piping times of peace to coax the noxious germ of this idea into life and to cultivate it with such watchful care that it has attained its present rank growth, poisonous and destructive to an efficient naval organization and bearing envy, hatred, and malice as its fruits.

In our Civil War, which was the first great war in which steam was called upon to perform an important part in naval operations, it was quickly realized that the efficiency of a fleet or of a single vessel depended directly upon the efficiency of the engineering staff, and there does not seem to have been any theory advanced that the engineers and their men were not essentially and professionally combatants, any more than that an equally silly and ungenerous issue should have been raised between artillery and infantry operating together in the army.

It is difficult to imagine the frame of mind of a man supposed to be in his right senses who can gravely air a theory that any person employed in any capacity on board a vessel engaged in operations of war can be anything else but a combatant, inasmuch as every detail of duty performed on board the vessel is for the object of increasing or using the ship's combative powers, and every shot fired at it is aimed at any one individual fully as much as at any other. Vicious and false as the theory is, it nevertheless has its devotees in the new navy, and is one of the chief articles of faith in that higher cult professed by the select naval society for self-inflation.

From the doctrines of this clique it is a pleasure to turn to the straightforward utterance of a genuine naval officer,—Commodore Foxhall A. Parker,—who, in describing the preparations for the battle of Mobile Bay, dealt with this question very briefly and honestly in the following words: "And in this faith all went to their posts, prepared to obey the regulations and 'fight courageously;' for in a fleet where a single shell, exploding in the boiler of a vessel, might subject the engineers and firemen to the fate of Marsyas, or a torpedo or infernal, exploding under her bottom, send all hands journeying *ad astra*, no one could properly be considered a non-combatant."

From among several hundred instances of bravery, heroism, and devotion on the part of members of the engineering branch of the navy during the war, the few following are given that the readers of this paper may more fully appreciate why the war period was not a good time to cultivate the non-combatant theory of the status of the naval engineers.

In the year 1863 the commander of the ironclad "Osage," of the Mississippi squadron, having received information that a Confederate steamer was tied up to the bank in the Red River, sent out an expedition under command of Acting Chief Engineer Thomas Doughty, with Assistant Engineer Hobbs as his lieutenant, which expedition captured and destroyed the steamer and another one, took a number of prisoners, and returned without loss to the "Osage." Mr. Doughty's report of the affair, dated October 7, 1863, follows:

"SIR,—In obedience to your order, I, with a party of twenty men, with the assistance of Mr. Hobbs, started for Red River this morning. Arriving at Red River, I could see no signs of a steamboat. I divided the party, sending eight men down the river to look into the bend below, and with twelve started up the river. When we had traveled about half a mile I saw the chimneys of a steamer. The woods were found so dense that we could not penetrate them, and the only alternative was to advance in sight. The steamer was on the opposite side of the river, and I feared those on board might see us in time to escape before we were near enough to use our rifles. No one saw us, and I chose a spit opposite her, where we could see any one who attempted to escape. I hailed her; two men were seen to run forward and disappear: I directed three files on the right to fire. The fire brought the men out, and at my command they brought to my side of the river two skiffs which belonged to the boat. I was about to embark a party to burn her, when I heard a steamboat descending the river. I ordered the men out of sight behind a large log and some bushes, and in two minutes I saw a steamer round the point above. I waited until she was within four hundred yards, and showed myself, and ordered her to stop. She did so, and I found myself in possession of nine prisoners and two steamboats. I knew I could not get them out of the river, and

I ordered the destruction of the first one captured, named the 'Argus,' and embarked on board the second, the 'Robert Fulton,' and steamed down to the landing where I first struck the river, where I ordered her to be set on fire, and in a few minutes she was one mass of flame. She was the better vessel of the two, and was valued by her owner at seventy-five thousand dollars. Neither of them had any cargo on board. I captured all the officers of the boats, one first lieutenant in the Confederate army, and three negroes."

Admiral Porter in reporting this affair to the Department said, "This is a great loss to the rebels at this moment, as it cuts off their means of operating across that part of Atchafalaya where they lately came over to attack Morganzia. This capture will deter others from coming down Red River. The affair was well managed, and the officers and men composing the expedition deserve great credit for the share they took in it."

In the various reports detailing the events of the battle of Mobile Bay, no less than fifteen naval engineer officers are mentioned by name for exhibiting courage, devotion, and other warlike qualities in the discharge of their duties. One of these so mentioned was Chief Engineer W. H. Hunt, of the "Oneida," of whom his commanding officer wrote: "He was cool and collected throughout the whole affair, and his gallantry was particularly apparent at the time of the accident to our starboard boiler. Mr. Hunt was severely scalded on both arms." A Brooke shell entered the "Oneida" on this occasion, pierced one of her boilers and exploded inside of it, killing and wounding a number of the engineer's force who were at their posts of duty in the fire-room. The fire-room is called a "place of safety" by the young men of the new navy who claim all combatant duties for their class.

Acting Third Assistant Engineer William G. McEwan, of the flagship "Hartford," was another who received honorable mention for the Mobile fight. He had his right arm shot off while attending to his duties as officer in charge of the fire-hose company, and was mentioned in the report of Captain Percival Drayton as follows: "He lost his right arm while busily employed on the berth-deck, where he was stationed, in assisting and comforting the wounded. He is spoken of by his superiors as most competent to fill the position of third assistant engineer in the regular service, for which I beg you to recommend him to the Hon. Secretary of the Navy."

The official reports of another celebrated naval engagement—that of the "Kearsarge" and the "Alabama"—contain the following regarding the engineers of the "Kearsarge:" "The engineer's division was admirably and efficiently conducted, under the command of Chief Engineer W. H. Cushman. Sidney L. Smith and Henry McConnell, third assistant engineers, were stationed on deck, and their conduct came immediately under my observation. It was distinguished by

coolness and vigilance. The other assistants, Mr. W. H. Badlam and Mr. F. L. Miller, were on duty in the engine- and fire-rooms, and, judging from the prompt manner in which the orders from the deck were executed, I know that their duties were creditably performed."

In another article published in this magazine,[1] the writer has described in detail the remarkable bravery in danger and disaster displayed by the chief engineer of the "Sassacus" on the occasion of that vessel's encounter with the ram "Albemarle," so it is only necessary here to refer to the fact that the commander of the "Sassacus" attributed the preservation of his ship to the "heroism and devotion" of the chief engineer, and that this chief engineer was subsequently promoted for "gallantry in battle and extraordinary heroism."

During the naval operations about Port Hudson in the spring of 1863, Captain Alden, commanding the division of the fleet below the batteries, desired to communicate with the admiral, who was above Port Hudson, and directed the commander of the gunboat "Genesee" to fit out an expedition from his vessel for that purpose. As the undertaking was one of great peril, volunteers were called for from among the officers, and three or four responded: from these Commander Macomb selected Acting Third Assistant Engineer Harrie Webster, although he was the only staff officer who had volunteered, put him in command of a boat's crew, and started him off on his dangerous mission. Mr. Webster successfully took his boat through the six or eight miles of intervening swamps and lagoons, delivered his dispatches to Admiral Farragut, received others from him to Captain Alden, and returned to the "Genesee" the same night. On the way back he landed and examined a signal station of the enemy, and, finding about it the fresh trail of a horseman, he took his party in pursuit, eventually overhauling and capturing at the point of his revolver a Confederate lieutenant with his horse, accoutrements, and important dispatches. The entire exploit was one of remarkable nerve and daring, performed as it was in the gloomy fastnesses of the enemy's country, and an expedition of a similar character would undoubtedly be a severe test for the courage of some of the modern self-styled combatants who enjoy sitting at a desk and denying their naval brethren of the staff corps any part in the military life of the navy.

The foregoing are only a few instances of bravery and military efficiency selected from a great number in my possession, but they ought to be sufficient to convince any but a hopelessly confirmed zealot that the performance of military duties and the possession of the instincts of patriotism are not limited in any military organization to a self-elected class, however flattering it may be to the members of that class to believe themselves endowed with the right to perform all

[1] "The 'Albemarle' in Albemarle Sound," published in issue of May, 1894.

fighting duties, or at least with the right of claiming all the honors and rewards for such duty when well performed.

The casualties among the naval engineers during the Civil War were great in proportion to their numbers, probably greater proportionally than in any other corps in the service; the reasons for this being obviously the unwholesome surroundings of the engineers' usual post of duty, and their inability to escape from a vessel suddenly destroyed, their more fortunate shipmates on deck in the latter case having at least a chance to struggle for their lives in the water that had swallowed up the ship. The details of this subject are well worthy of careful investigation and thought, but this belongs more properly to the province of a complete history than to a magazine sketch, so for the present it is sufficient to say that from the incomplete records that I have examined I find that more than one hundred of the naval engineers died during the four years of the war from wounds received in battle, from disease incurred by exposure in the line of duty, or from privation and neglect in the enemy's prisons, while about thirty others were killed outright in action or were either killed or drowned in the destruction of their ships by torpedoes or other means.

The most important legislation affecting the engineer corps during the period of the war was contained in an act to reorganize the Navy Department, which act was approved July 5, 1862. The engineering department had previously been a sub-office in the bureau of construction, but this act created it into an independent bureau, and also provided that the chief of the bureau should be selected from the list of chief engineers of the navy. This legislation was due to the efforts of Engineer-in-Chief B. F. Isherwood, and is probably the most important law in the statutes respecting the engineer corps, with the exception of the creative act of 1842.

The question of rank did not amount to a grievance with the engineers of the war period, they being much better off in this respect than are the engineers of the present day. Early in 1859 the Secretary of the Navy, Mr. Toucey, had issued the following order, conferring military rank upon the officers of the engineer corps:

"NAVY DEPARTMENT, January 13, 1859.

"Chief engineers of more than twelve years will rank with commanders.

"Chief engineers of less than twelve years with lieutenants.

"First assistant engineers next after lieutenants.

"Second assistant engineers next after masters.

"Third assistant engineers with midshipmen.

"This order confers no authority to exercise military command, except in the discharge of their duties, and no additional right to quarters."

This order was affirmed by Congress March 3, 1859, with the words "except in the discharge of their duties" stricken out, which omission was brought about by the efforts of the anti-engineer element in the service, and served to embarrass the engineers in the performance of their duties, but did not affect the actual rank conferred upon them. It did, of course, impair the efficiency of the engineers' department, and consequently that of the ships, but that was a small matter compared with the self-esteem of the conservative class of sea officers, which would have been grievously wounded had the engineers been legally authorized to exercise command over their own firemen. In view of the higher ranks created for line officers, Mr. Secretary Welles, in 1863, issued another order on the subject, which confirmed the positive rank for all staff officers and made a considerable advance in the rank of chief engineers, who were given the rank of lieutenant-commander for their first five years' service, to rank with commanders after five years, and with captains after fifteen years.

Under the operation of these two orders there was harmony between the line and staff during the years of the war, and all heartily worked together without friction or jealousy, the common good of the navy and the country being the only object strived for by both classes of officers. The discovery that comparatively high rank for the senior staff officers was a menace to "the best interests of the service," as the personal interests of a particular naval clique is styled by the members of that clique, was reserved for peace times, four years after the war had closed. Then an order was quietly prepared and issued which set aside the Welles order of 1863 and restored the one of 1859, thus re-establishing the rank of commander as the highest grade for the staff. The direct effect of this was to degrade almost every staff officer one or more ranks, with the accompanying humiliation of stripping the insignia of their former rank from their uniforms. In at least one case this latter indignity was made the occasion for a formal ceremony on the quarter-deck of a vessel with the crew at general muster, the staff officers being deprived of their shoulder-straps by scissors in the hands of enlisted men, as though they were being degraded for treason or some heinous military crime, instead of being robbed of the rank that they had won in the trials and dangers of a war for the preservation of their country.

Before this occurred, other events disquieting to the engineers and other staff officers were taking place. The readjustment of numbers in the various staff corps to put them on a peace footing made promotion almost an impossibility with them, and this condition was aggravated by the fact that the same authorities who discovered an immediate necessity for reducing the membership of the staff corps also discovered that the line needed more regular officers for its peace establishment than had been in service during the war, and this in spite of the fact

that the sailing-ship as a war-vessel had become obsolete. The process of filling up the ranks of the line induced a rush of promotion that was simply feverish. Young men, scarcely out of their teens, who had been hustled through the Naval Academy so rapidly that they had had time to acquire only the barest rudiments of a common-school education, were also hustled through the junior grades of the line within two or three years, and almost before they realized what was going on found themselves in positions of rank and responsibility without having had the experience necessary to fit them for such positions.

This rapid promotion of line officers was in itself no wrong to the naval staff, but one of its direct effects constituted a very genuine grievance for that branch. The inexperienced and half-educated youths who suddenly rose to positions of authority were so unfamiliar with military usages and so dazzled by their advancement that many of them found a personal gratification in the arbitrary exercise of their official prerogatives, without showing any consideration for the feelings and rights of other officers or any appreciation of justice, they not having had the experience to teach them that a liberal and just exercise of power is the only method by which fidelity and loyal obedience can be assured. The arbitrary and unreasonable conduct of some of these youngsters immediately occasioned friction with the staff officers, many of whom had held commissions in the navy more years than the young line officers had been upon the earth, and this trouble became a grievance with the staff inferior only to their degradation in rank and the hopelessness of their prospects for promotion.

The above were not by any means all of the causes of discontent then existing, but are sufficient to show that the naval staff at that time was in a most unhappy condition, another evidence of which is the fact that within five years after the close of the war no less than one hundred and ninety-one of the regular engineers resigned from the service, this being more than forty per cent. of the number in the navy at the beginning of the year 1865. The order of 1869 reducing the rank of the staff was the last straw piled upon the back of patient bearer of heavy burdens, and the staff corps then combined in an appeal to Congress, the result being a law, approved in 1871, which conceded much to the staff in the matter of pay, established numbers in the various corps, and in some other things, but which left the question of rank in a much more unsatisfactory condition than it had been before.

The staff had asked Congress for the definition of rank that had long established the status of staff officers in the army, and it was the intention of Congress to accede to that request, as is shown by various speeches made at the time in both branches of the legislative body. The bill passed the House of Representatives in the desired form, but by the time it got through the Senate the mysterious adjective *relative*

was introduced as a definition of staff rank. No satisfactory interpretation of what *relative rank* in the navy means has yet been discovered, the consensus of opinion being that it is an empty and meaningless phrase. It has proved to be an apple of discord which has provoked a strife between line and staff in the navy, beginning with the approval of the act of 1871 and continuing with unabated vigor ever since. When this truceless war is over, which cannot be until the *de facto* status of the naval staff as a combatant element in the military organization of the navy is recognized by law beyond the reach of equivocation, its history will form a most important chapter in the record of our naval progress, as well as an instructive lesson regarding certain impossibilities under our form of government.

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(To be continued.)

REGULATIONS AND MANŒUVRES OF THE RUSSIAN FIELD ARTILLERY.[1]

THE general idea of the instruction is laid down by regulations which correspond to our general basis of instruction, and was approved of in the year 1884.

These regulations are divided into two parts, of which we are about to give a summary analysis.

I.—ANNUAL COURSE OF INSTRUCTION.

Annual instruction is divided into a winter and a summer course.

The winter course, lasting from the 1st of October to the 1st of May, contains, first of all, a preparatory period, extending up to the 1st of December, which is set aside for the improvement of old soldiers for any specially-selected subject and for the preparation of instructional classes and the breaking in of young horses. From the 1st of December to the 1st of May, the time appropriated is required more especially for the instruction of recruits and the preparation of the classes and officers, for drill with the battery mounted.

The spring course, from the 1st of May to the 1st of October, contains,—

1. A period of eight weeks which is set aside for the drill of batteries mounted, for marches in various kinds of country, for revolver practice, for field work and for drills, having as their idea a battery acting independently or as forming part of one or several groups of batteries.

2. A period of two or three weeks, during which fire discipline is practiced and the entrainment of horses, and comprises also instruction on the method of making marches, the choice and occupation of positions.

3. A period of drills and manœuvres of artillery in conjunction with other arms. This important part of the instruction comprises, besides camps of instruction, a large number of preparatory tactical exercises, in which are artillery manœuvres with other arms.

In this manner the regulations enjoin the carrying out of tactical

[1] Translated and summarized (from the Russian) by Captain Ollivier and Lieutenant Guieysse of the French Artillery. Translated from the *Revue d'Artillerie*, January, 1894, by Captain S. Lushington, R.A.

exercises, such as a battery acting by itself with a regiment of infantry, or a regiment of cavalry, or a mixed demi-brigade, and, further, brigade and divisional drills; the horse artillery takes part in brigade and divisional manœuvres with the cavalry.

All these drills are carried out, both in simple and more complicated forms; their total duration is about four weeks.

II.—DETAIL OF DRILL AND INSTRUCTION.

We find in this second part the enumeration of the different lessons and manœuvres to be done by field artillery. It contains also the schemes of instruction; we will quote some of them:

Drills and instruction take place every day of the week; they stop at mid-day on Saturday. The time taken up should not exceed six working hours a day. Instructors are requested to keep well in mind, before commencing their instruction, the result they desire to obtain, and to bring examples as much as possible into their method of teaching. Drills are short, but carried out with energy. In theoretical instruction they must strive to make the individual man understand the things taught him, and not permit him to answer in ready-made sentences, parrot fashion.

The regulations which we will sum up hereafter are,—

1. Regulations for field gun drill and drill for guns of position.
2. Regulations for instruction in laying and the teaching of layers in the field and mountain artillery.
3. Instruction in fire discipline for a field or mountain battery.

REGULATIONS FOR DRILL

for a single gun and for a battery in the mounted artillery (1884).

Division of the Regulations.—All regulations are drawn up solely with a view to the preparation of the battery for field service; every other consideration is excluded from them. An appendix is set apart for salutes and for formations for reviews and marches past.

The regulations are divided into three sections:

Section 1.—Training with a single gun: standing gun drill with the movements of the limber and elementary training in driving drill.

Section 2.—Battery training: manœuvres of the battery mounted, rates of fire, and special orders for reviews and marches past.

Appendix.—Instruction in driving the wagons, manœuvres in échelons, and mode of supply of ammunition. The wording of the regulations is concise; no generalization is found in them, and no collection of opinions liable to cause different individual interpretations.

I.—TRAINING WITH A SINGLE GUN.

Standing Gun Drill.—The detachment required for standing gun drill comprises one mounted fire-worker (literal translation); non-

commissioned officer in charge of the carriage (gun-carriage or wagon), six numbers for a light gun and seven for a gun of position; three drivers, one for each pair of horses.

Entering and Leaving the Gun Park.—In the park the gun is unlimbered, the muzzle facing the entrance, the limber turned with its pole pointing towards the point of the trail, the axle-tree being at a distance of thirty-six paces from the trail-eye. All the distances in the drill-book are reckoned in paces,[1] which simplifies instruction.

To enter the gun park the squad, both gunners and drivers, are paraded in some convenient spot, the gunners in double rank, the drivers with their pair of horses each, on the left, and are marched off either from a flank or in line to the rear of the limber. They take post individually, the horses are harnessed, and the gun stores served out immediately. As the stores are numerous and are spread about, both in the pockets on the trail and under the footboard of the limber, and in addition the gunners having to help the drivers to hook in, it has been thought unnecessary to assemble the whole detachment round the limber once this duty has been attended to, and to place them as in action round the gun by a special word of command; the gunners are then told off in the following manner:

Nos. 1 and 3 like our own first and second numbers on the left, Nos. 2 and 4 like our first and second numbers on the right. No. 5 in the same line as 1 and 3, in rear of them and facing to the front; No. 7 in like manner in rear of 2 and 4. No. 6 beside the right wheel of the limber facing his front. No. 1 has a tube-pocket and lanyard. Nos. 3 and 5 have a cartouche each, that of No. 3 having in it a pocket containing fuse implements. No. 4 has the sponge, which he holds upright, the stave towards his shoulder. No. 4 is replaced in guns of position by No. 7. Nos. 1, 2, 3, and 4 on the word of command place the straps, which are used for pulling the gun-carriage when unlimbered, over their shoulders and hold them on the opposite hip when the distance to be covered is sufficiently great.

The hand-spike is shipped in rear, the tangent sight put in place, and a pricker attached to the gun-carriage.

To leave the gun park the movements are reversed; the drivers always remain mounted, the gun detachment alone dismount.

Duties of the Numbers.—No. 1 places the friction-tube in the vent and fires.

No. 2 pricks the vent, opens and shuts the breech, pricks the cartridge with the pricker down the vent, ships the handspike, lays and gives the order to fire.

No. 3 prepares the projectile, sets the fuse, places the shell and cartridge in the bore, and places himself at the handspike to traverse.

[1] The pace is about twenty-eight inches or one archive.

No. 4 sponges out after every round, rams home the projectile, and pushes in the cartridge with the rammer as far as it will go.

No. 5 brings up ammunition; he holds the shell in both hands, while No. 3 sets the fuse.

No. 6 gives out ammunition.

No. 7 (only laid down for guns of position) helps No. 3 in traversing. If the order is given to bring up ammunition in the portable magazines for shells and for cartridges, then No. 6 assists No. 5.

After every round the gun is run back without further word of command. To do this Nos. 1 and 3 man respectively the wheel and the trail-eye on their own side, while on the left No. 4 mans the wheel and No. 2 the trail-eye; this inversion of numbers is explained by the following fact, that during firing the fire-worker remains in command of the team, and the layer (No. 2) is the one who gives direct orders to the detachment; it is therefore necessary that he should be placed in such a position that he is able to direct the gun when it is run back.

The first round is loaded by word of command: *With shell load (or with shrapnel, or with case-shot, or with blank cartridge)*, adding, if loading with shrapnel, *fuse so many seconds.* The laying of the first round is done on the word of command: *Fire from each gun on such a target, so many lines* (elevation), *deflection so many lines.* (The tangent sight and the deflection leaf are graduated in lines, a line amounting to .09842 inch). After the first round loading and laying go on without ceasing and without further orders. During the progress of the firing the ranges given are altered by word of command when desired.

Movements of the Limber.—The same as in our own service, there are two methods of limbering or unlimbering. Usually these movements are done at the trot; if it is desired to do them at a walk, it is necessary to add that in the word of command. Limbering up to the front is done in the following manner: the limber is brought up one and a half paces to the right of the gun, and stops when it has gone three paces beyond the axle-tree arm. All the detachment place themselves at the trail and lift it to the height of their shoulders; when the limber has finished this movement Nos. 1 and 4 man the wheels of the gun-carriage and turn it three-eighths of a circle. Nos. 5 and 6 man the wheels of the limber in order to back it, so that the trail-eye may be placed on the limber-hook. The carriage is straightened by moving it forward.

To limber up to the rear all the numbers lift the trail and turn it one-eighth of a circle to the left. The limber commences its movement half right, then wheels to the left and is placed facing to the rear, in prolongation of the former direction of the gun. All the numbers then carry the trail towards the limber which Nos. 5 and 6 back, so that the trail-eye can be placed on the limber-hook.

The unlimbering is done in the following manner: for action front it reverses to the left, goes straight to its front, and is placed, after reversing again to the left, in prolongation of the gun, the fire-worker halting at sixteen paces from the end of the handspike; for action rear the limber moves at once half right, again to its front, when it has covered eight paces, and comes into position by reversing to the left. In all these movements the fire-worker has the same duties as those laid down for him in driving drill; his place is one pace in front of the lead horses, and he directs the movement of the limber. In unlimbering to the rear he marks by his position how far the carriage must advance obliquely before moving forward again.

The drill-book provides for an abnormal movement in case of action rear and a movement of the limber to accommodate itself to it, when the ground prevents the usual movements. The gun having been unlimbered, the limber moves on at a walk to such a distance that it is not in the way of the recoil (at least eight paces); it remains facing to the rear. The limbering up is done by backing the limber, the two numbers told off for that purpose manning the wheels, or again the gun can regain its place in the battery by moving to a flank; in this case the trail is carried round a quarter of a circle to the left or right, the limber is placed as far as possible in its usual position for limbering up, and moves off by a wheel to the right or left.

In these movements the detachment keep their side-arms and stores, No. 4 retains the sponge; the handspike only is replaced on the trail. The regulation paces are the walk and the trot; the pace of the walk is 3.317 miles per hour, and that of the trot 6.6 miles per hour; this slowness of pace is probably due to the bad state of the roads in Russia.

When the battery moves at a walk, the detachments follow on foot and are posted on either side of the gun: Nos. 1 and 4 in a line with the axle-tree of the gun-carriage, 5 and 7, the axle-tree of the timber, 2 and 3 half-way between them; No. 6 in a line with the movable swingle-tree fixed to the end of the pole, to which the centre horses are harnessed. One notices here the change of place of Nos. 2 and 4, which is rendered necessary by the duties of these two numbers in the movements of the limber. When on account of the ground the gunners cannot remain on either side of the gun, they form detachment rear. At the trot Nos. 1 and 2 mount on the axle-tree seats, 3, 4, and 5 on the limber; 6 and 7 follow on foot, there being no places for them; they rejoin their gun at the double when it halts. We shall see further on, when discussing the movements of the battery-wagons, that Nos. 6 and 7 can be carried upon them when the battery moves into position at the trot.

The fire-worker guides the carriage, and is responsible for the pace and direction. His usual place, and the only one which he occupies in

drill with a single gun, is at the head of the team and one pace in front of it. He keeps to this place while the battery is firing. The lead driver drives so that his riding horse and off horse follow directly the line given by the fire-worker. The centre and wheel drivers follow the lead, and thus the proper direction of the carriage is assured. At the halt the gun captain moves on three paces if at a walk, six if at a trot, and the drivers move steadily up to their proper distance, keeping their tracts slightly stretched.

The Russian drill-book allows for the individual changes of direction of carriages; the right or left wheel, ninety degrees; the right or left about wheel, one hundred and eighty degrees; and the half right or left wheel, forty-five degrees, correspond to our own.

All these changes of direction are done by a circular movement, the radius of which for half right or left, or right or left wheel is three paces, and for right about wheel six paces.

There is no special movement for a quarter change of direction. In the movements of a battery the guns have to make other changes of direction besides these wheels of a fixed amount; the movement is done by the word of command:

1. *Gun, left or right shoulder.* 2. *March.* 3. *Right or left.* The instructor can order a wheel to the right or left to any particular angle, but always less than ninety degrees.

II.—BATTERY TRAINING. GENERAL PRINCIPLES.

Composition of the Battery.—The battery is composed of eight guns. It is divided into two half batteries of four guns, and these again into two sections of two guns each. There are some four-gun batteries; they are an exception and not worth separate discussion, the principles governing them being the same; they drill partly like eight-gun batteries and partly like half batteries of eight-gun batteries. The *personnel* of each of the eight guns is made up as was shown in the "Training with a Single Gun," three drivers, six or seven gunners, and one fire-worker. The battery is officered as follows: 1. Battery commander (colonel or lieutenant-colonel). 2. Commanders of half batteries (captains) and the commanders of sections (lieutenants or sub-lieutenants). As a rule there are only two lieutenants or sub-lieutenants on the active list; they command the flank sections. The centre sections are under the direct orders of the captains, who have thus a double rôle in all the drill, commanding half batteries and commanding centre sections. The complication of the drill-book arises in a great part from this fact, as does the difficulty of the drill and the necessity of passing direct from training with a single gun to battery training. In one case only do the captains give up the command of their half batteries, to become simply section commanders, and that is during firing;

even then they can be taken away to resume their proper commands, in case of firing salutes by half batteries.

BATTERY DRILLS.

Formations.—The battery has two kinds of formation, line and column. The battery in line may be in five different formations: 1st, in action; 2d, in line facing to the front; 3d, in line facing to the rear; 4th, column of subdivisions; 5th, oblique order (in which all the subdivisions are inclined right or left).

For the first three formations there are three kinds of intervals:

Full interval	27 paces (21 yards).
Half interval	12 paces (9.3 yards).
Close interval	6 paces (4.65 yards).

In action it is necessary to have the full intervals if possible; the battery, therefore, occupies a front of one hundred and eighty-nine paces (one hundred and forty-seven yards); the distance between the guns and limbers is sixteen paces (12.4 yards). When the incline is ordered, it is necessary that the battery should first be at full or half interval; these intervals when the movement is finished are reduced to twenty paces (15.5 yards) or nine paces (seven yards) respectively. When column of subdivisions is formed the battery must be beforehand at full interval, when it is finished the distances between guns is three paces (2.3 yards). In the gun park guns are at close interval.

In line the battery commandant is twenty-five paces in front of the centre of the battery; the half battery commanders ten paces in front of the centre of their half batteries; section commanders four paces in front of the centre of their sections.

In action the battery commandant is eight pieces in rear of the centre of the line of guns; half battery commanders and commanders of sections respectively two and four paces in rear of the centre of line of guns of their commands.

The battery can be formed in column—

Of single guns (subdivisions); distance closed to three paces; formation done by moving to the front in succession.

Of two guns from the centre; distances closed to three paces.

Of sections; distances closed to six paces; formation as above.

Of sections at full distance; formation by wheeling.

Of four guns from the centre; distances closed to six paces.

Of half batteries; distances closed to six paces; formation to the front.

Of half batteries at full distance; formation by wheeling.

The columns can be at full, half, or close intervals. They take the same formation as those of the battery in line, excepting action,—viz., facing to the front, to the rear, or to a flank, and at an incline.

According to the nature of the column, the officers' places are either in front of their commands or by the centre of the flank where the formation has left them, the commandant at twenty-five paces distance, half battery commanders at ten paces, and the section commanders at four.

On any order to wheel (by subdivisions), either when in line or column, the officers wheel at once independently in the direction ordered and remain in their new position. This is the distinguishing feature in movements entailing wheels by individual carriages, which places the battery in the same formation as movements made by sections and half batteries.

When giving instruction in drill the commandant is not obliged to keep the position laid down for him; he must go wherever he considers his presence necessary.

Dressing.—Dressing of carriages is obtained by dressing of fire-workers. The section commanders have nothing to do with the dressing of their sections; this cannot be helped more or less, as they are so unequally distributed among the sections. The dressing is taken from a gun of direction. For a battery in line it is No. 5, on account of the large front taken up. In columns, where the front is more restricted, dressing is kept by the gun on that flank which is leading; hence dressing is by the right in advancing, by the left in retiring.

During wheels by sections and right-about wheels, dressing is kept by the outer flank; during wheels right or left, or half right or left, dressing is kept by the pivot flank. In all movements in column or to a flank, every gun must (except after a half wheel) keep at the distance ordered from the one in front.

Fire Discipline.—Loading is done by order of the battery commandant, but it is forbidden to have this done by all the guns working together, in order not to sacrifice careful loading to mere appearance of smartness. The orders are very strict on this point.

When firing shell, case-shot, or blank, all guns are loaded at the same time, as a rule, but also they can be only loaded by the particular order of the section commanders. When firing shrapnel, loading is done, as a rule, by single guns or sections, single guns or sections only being loaded by order of the battery commandant; or if desired all the guns can be loaded at once.

As often as an alteration of elevation or change in duration of fire is ordered, it is obeyed at once by every gun; during the ranging, guns can thus change their target several times before the time comes for them to fire. The projectile cannot be changed till the one already in the bore has been fired. Firing can be done by single guns, by section salvos, and by half battery or battery salvos.

Advance of a Battery in Line.—The idea has been explained when discussing the method of dressing. When the battery trots, all the

Nos. 6 and 7 fall in the rear of No. 5 gun. The battery can be led on to a given alignment by placing the Nos. 6 as markers there previously.

Intervals can be modified by taking one gun as a gun of direction. The movements of individual guns resulting from this being done at a trot, it is necessary on that account to mount the detachments. During the movement dressing is kept by the gun that takes the direct line; when finished, as before, by the centre.

At the preparatory word of command to the "halt," the fire-workers rapidly correct their dressing, but do not dress without special word of command when the battery is halted.

To bring a Battery up into Position.—The commandant, followed by a trumpeter, advances and reconnoitres the position. He then calls up, if there is room, the gun captains, who dismount and pick out the places for their guns to come into action. Orders are then sent for the senior officer remaining to bring up the battery. In coming into action front, the guns can either face to the front or rear; on arriving at the position they either wheel about or not. If they come into action without reversing, the drivers drive straight on the fire-workers; if they come into action by reversing, they drive half an interval to the right of the fire-worker, so that after wheeling about (to the left because they are advancing) they come into the place selected.

Changes of Direction.—The changes of direction are done either singly or as a battery.

The changes of direction by individual guns are performed at angles of forty-five degrees, ninety degrees, and one hundred and eighty degrees as required; these are wheels. When a right-about wheel is ordered at close interval, even number subdivisions move twenty-four paces to the front on the preparatory word of command.

Changes of direction of front are done in two ways. On the word of command, (1) Battery left shoulder; (2) march; (3) forward, dressing by the centre, the guns describe an arc of a circle to any extent required, but always less than ninety degrees, keeping equal intervals. The movement is only our right incline (French drill). On the word of command, (1) Right turn; (2) march; (3) dressing by the centre, the pivot gun wheels to the right, the remainder making a half right wheel, increase the pace, not keeping any interval, and gain the new direction, which is always at an angle of ninety degrees from the former, by another half right wheel, picking up their correct intervals, on finishing the movement.

The changes of direction of front can also be made in the following manner: being at an incline, any gun whatever is named as gun of direction, the remainder increase or diminish the pace and take up their interval and dressing by the gun named. Thus, change of direction can be made to very small angles by giving any one gun a point to march on.

Movements in Column.—Columns can perform the same manœuvres as line, at full interval; wheeling and opening and closing intervals. They can change from full to close distance, and the reverse, if it is possible; when they close up, the movement is done on the leading body, when they open out, from the rear.

When the head of the column changes direction, the units of the column (subdivisions, sections, or half batteries) execute the movement in succession "Left shoulders." In close columns (quarter columns) the units of the column behind the leading one, at the order of their commander, before their change of direction, make a half wheel to the opposite side to which they are ordered to go, and having thus disengaged, move "Left shoulders" on arriving at the spot where the leading unit has made its change.

In columns from the centre a difficulty arises as to the command; guns which are at the same level (of dressing) must change direction at the same time, but, belonging to different sections, they are under orders of different officers. For column of two guns from the centre, which is the most complicated, the procedure is as follows: the commander of the first half battery takes charge of the two leading guns, Nos. 4 and 5, the commander of the second half battery that of Nos. 3 and 6, first section commander that of Nos. 2 and 7, and fourth section commander that of Nos. 1 and 8, the two rear guns.

Changing from one column to another is done by the same method of wheels and deployments. These movements are always done on the move or in advancing.

Deployments.—Deployments are made from column by subdivisions, sections, or half batteries to their actual front or in a direction at right angles to it, by the three methods described in the French drill-book, as "By," "To the," or "On." Deployment to the right or left can only be done by columns at full distance or column of subdivisions. Columns at full distance are the only ones which can deploy in a direction at an incline to the line of march.

Columns from the centre deploy in the same numerical order as they were originally, the flank guns moving upon the right and left in line if the column is advancing, or opening out to allow the subdivisions in rear to form up between them if retiring. These columns can also deploy at right angles to their line of advance by a wheel to the right or left into line. Columns can form at once into line for action according to the methods shown for forming into line from column. The units of the columns come into action according as they arrive into position. The unit of direction for the deployment places itself in action at the signal from the battery commandant (commence firing bugle call). When the column deployed is a column of subdivisions, the leading gun of each section is halted by the section commander, the second by its own gun captain; when it is a question of column from

the centre, one runs against those difficulties as to commands which have already been pointed out when discussing changes of direction of the head of a column, and these difficulties are solved in like manner to that already demonstrated in such cases.

III.—INSTRUCTIONS FOR THE MOVEMENTS OF WAGONS.

Composition and Drill of Échelons.—Batteries of position have sixteen wagons, field batteries only twelve. In addition, they have a spare gun-carriage, an ambulance-wagon, and a certain number of general service wagons.

These carriages are divided into two échelons. The first contains four wagons, the second the remaining carriages. Both are placed under the orders of an officer of the rank of lieutenant or sub-lieutenant. This officer accompanies the first échelon, a non-commissioned officer is told off to actual command of the second. To each wagon are told off one non-commissioned officer in charge, two gunners, and three drivers with their pairs of horses. The gunners have bags for carrying ammunition.

In the gun park the wagons are placed in rear of the guns, the two échelons being in the same or different lines, the flank wagons covering the flank guns, the remainder at equal intervals between them. The spare gun-carriage and ambulance-wagon are in rear of the centre in a third or fourth line.

The principles of the drill for the échelons of wagons are the same as for the battery. The two échelons, when the battery marches, following in rear of the guns. Before entering the zone of fire, the second échelon halts and takes a distance of eight hundred and seventy-five to one thousand and ninety-three yards. The first échelon follows the guns and manœuvres in the following manner. Each wagon is specially told off to a section, and follows that section if it is separated from the rest of the battery. The drill of the first échelon is carried out by the officer in command of the échelons on the same principle as the drill of a half battery, both as to pace and repetition of the orders of the battery commandant which may affect the wagons. The distance separating the échelon from the guns is not laid down, but should be as small as possible (say fifty paces), but large enough to prevent its interfering with the manœuvres of the battery. In advancing the échelon follows the battery, in retiring it precedes it. In advances in line or column with a front of four guns, the four wagons cover the four centre guns; in advances in column with a front of less than four guns, the wagons form close column of a similar breadth to that of the battery. In movements to a flank the wagons follow suit, the leading wagon in line with the leading gun.

When advancing at a trot, the two wagon numbers mount on the boxes; the first échelon is also used to carry the Nos. 6 and 7 of the gun detachments.

Duties of the First Échelon during the Fight.—The échelon commander, taking his general idea from the orders given by the battery commandant, places his wagons under cover when possible and available. He keeps them slightly to a flank, as much as possible off the roads, in order that communication may not be blocked and that he can quickly wheel about if the battery retreats.

The duty of the échelon commandant is to keep the establishment of the battery up to its full strength in men, horses, and ammunition. Ammunition can be ordered to be supplied direct from the wagons to the guns. When a certain time has elapsed after the opening fire, the échelon commandant orders the remaining ammunition to be taken out of certain wagons, and when these are empty sends them back to the second échelon, which returns an equal number of full ones. Men and horses to replace casualties are brought up at the same time from the second échelon.

Duties of the Second Échelon.—The second échelon, except in cases of absolute necessity, should be beyond range of the enemy's fire. It should take up a position which allows it to approach as close as possible to the battery, it should have easy means of access to it; a fire-worker is sent to point out to the échelon commandant its position, and the direction to be taken by the wagons which will go to replenish supplies. The second échelon must furnish to the first everything required by it, even if its mobility suffers.

It replenishes supplies from the sections of the ammunition column which arrive on the battle-field by order of the officer commanding the artillery. This replenishment is done by transferring the supplies.

SPECIAL ORDERS FOR HORSE ARTILLERY.

A horse artillery battery is composed of six guns; it has twelve wagons formed into two échelons of six carriages each. A spare gun-carriage and a light ambulance-wagon go with the first échelon. The general service wagons march with the second échelon. The detachment comprises six gunners and three horse-holders.

As a usual rule these nine numbers are drawn up in two ranks, three paces in rear of the muzzle; they take posts as follows:

1. In two ranks on either side of the gun; the first rank in line with the wheel horses, the second in line with the limber-wheels.

2. In single file or half sections, three paces in rear of the gun.

In action the detachment horses are drawn up in double rank, three paces in rear of the limber.

The strength of officers comprises one battery commandant, three

section commanders, and one wagon commandant. There are no half-battery commanders.

The regulation paces of the horse artillery are the walk, trot, and gallop. Their speed is respectively 3.317, 7.9, and 15.8 miles per hour.

Horse artillery does not form column of half batteries.

In forming column of four guns from the centre, Nos. 1 and 6 cover Nos. 2 and 5.

For all formations into column the detachments form in two ranks on either side of the gun, except in column of route, when they march in the usual formations; that is to say, in double rank in rear of each gun. It therefore happens that in column of subdivisions the detachments can be placed in two different ways, according as it is a drill formation or a formation for column of route.

EXCHANGE OF STATIONS.

THE movements of regiments for the exclusive purpose of effecting changes of stations is a practice confined almost entirely to the United States.

Previous to the war of the Rebellion changes of this character were seldom made, and then, as now, were largely dependent upon various conditions and influences for their accomplishment. No attempt to establish a system upon which all the regiments of the army might hope to share alike in these movements has apparently ever been considered. Possibly no practicable system of exchange involving the transportation of both officers and men could be devised, however much it might be desired. The country embraces nearly the half of the continent, and the distances between military stations, even those nearest to each other, are often very great. In addition, the condition of the public appropriations available for the transportation of troops varies in amounts towards the close of each fiscal year, when these changes usually occur, sometimes permitting the movements of regiments from the most distant stations, and again limiting exchanges to regiments located nearer to each other.

Under the operations of the present method of exchange some regiments have served for many years in the same sections of the country, while others the mean while have made frequent changes. Between the two extremes there is scarcely a choice in the matter of advantage. If anything, the regiments less frequently disturbed have had the greater reason to be thankful.

During a period of twenty years, for which data is at hand, beginning with 1865 and ending with 1885, there were one hundred and thirteen changes of regiments of the United States army from one part of the country to another. Several of these changes occurred between regiments stationed upon the Atlantic and Pacific coasts, and all of them extended from one geographical department to another. In the aggregate they involved a large expenditure of public funds, and in many instances imposed pecuniary distress upon officers and men of the several organizations which had been required to move.

During the period named the Fifth Cavalry, the Eighth, and the Twenty-third Infantry Regiments moved five times each, the Third

and Ninth Cavalry, the Third Artillery, the First, Sixth, Seventh, Thirteenth, and Twentieth Infantry Regiments moved four times each, and the Second, Fourth, Sixth, and Tenth Cavalry, the First and Fifth Artillery, and the Fourth, Tenth, Eleventh, Twelfth, Eighteenth, Nineteenth, Twenty-first, and Twenty-second Infantry Regiments moved three times each.

On the other hand, the First Cavalry moved but once during this period, and served continuously for eighteen years and five months in the Division of the Pacific. The Fourth Cavalry served for fourteen years in Texas, and the Second and Third Cavalry about eleven years each in the Department of the Platte. The Second Artillery served continuously for over twelve years in the Department of the East. The Seventeenth Infantry served for seventeen years in the Department of Dakota,—including two years beyond the period under consideration,—followed by about seven years to present date in Wyoming, having had but one change from department to department in about twenty-four years. The Fourteenth Infantry served fourteen years during the period named in the Northwest, followed by about ten years more to present date in the Department of the Columbia, having had but one change from department to department in twenty-four years. The Fifteenth Infantry served continuously for thirteen years in New Mexico, and for twenty-five years previous to its arrival at Fort Sheridan, Illinois, in 1890, had been stationed west of the Mississippi River. The Twenty-first Infantry served over twelve years in the Northwest, the Second Infantry nearly twelve years in the South, and the Twenty-fourth and the Twenty-fifth each about eleven years in Texas.

While this data is offered to exhibit the inequalities of the method pursued in effecting changes of stations among the regiments, it is not presented upon the supposition that any regiment has in any manner been deprived of any inherent right it may be supposed to possess in the premises, either on account of having been moved or not having been moved, with the view of effecting a change of its stations. In the absence of statutory provisions, it is believed that a regiment has simply a constructive right for exchange, if indeed it may be said to possess any rights in the premises at all.

If the constructive right of a regiment for exchange in its proper turn can be admitted, it must evidently rest simply upon the equity involved. If the First Infantry, for illustration, is required to exchange its stations for others simply for the sake of change, the Second Infantry, or any other regiment, it would seem, has a good case in equity for life consideration, when it shall have outstayed all other regiments in point of time at the various stations occupied by it.

But it seems quite impossible to establish a right for a change on account of prolonged service in a given locality. Unfortunately, the

principle that such service should obtain first recognition is seldom adhered to as sufficient in itself by those most interested, but is supplemented often by appeals to social and political influences, thus virtually abandoning all question of equity and constituting such appeals a higher court for the final arbitration of the various claims.

As a rule, the War Department has reluctantly consented in the past to the movements of regiments for the sake of effecting changes of stations, except, possibly, when the necessities of the service or sanitary reasons have been apparent. General Sherman moved the head-quarters of the army from Washington to St. Louis in 1874 on account, principally, of his inability to control the transportation funds of the army, or the movement of troops from one part of the country to another, which practically amounts to the same thing. The Secretary of War held then, as he is reported to hold now, that changes of regiments should rarely be made, and never except for the best of reasons from a public stand-point, involving primarily the interests of the government rather than the desires of individuals.

The views of the War Department in 1885 were doubtless well expressed by General Sheridan in his letter of November 20 of that year, published in Circular No. 11, from the adjutant-general's office, and applied to regiments, doubtless, as well as to companies. "The interests of the service," says the general, "sometimes require that companies of the same regiment should be interchanged; but when the practice of such interchanges is fixed periodically to the extent of raising in the minds of officers and soldiers a belief that they have claims for a change of station, its perniciousness becomes apparent, and it should be discontinued to a degree which will discourage such belief."

The same view of the policy of the government in the matter of changing the stations of its regiments is still entertained, and will find more careful enforcement, doubtless, in the future than ever before, on account of the possible reduction in the public revenue and the necessity for the practice of strict economy in all governmental affairs. It seems to be more and more evident as our country grows in profit by the experience and becomes subject, largely, in the end to the same conditions that prevail in older civilizations. In the British service regiments are seldom, if ever, moved for the sake alone of effecting a change. Certain regiments of this service are moved for sanitary reasons from India and elsewhere, and others are required to take their places. These changes and those that grow out of them occur to each regiment once in about ten years, and constitute all the changes that ordinarily occur in the British service. In Germany and France and Austria and Italy changes of stations, for the sake of change, are believed to be almost unknown. In the vast empire of Russia, embracing an area more than double that of all Europe, the

statement may be ventured, based, however, upon incomplete data, that the immense army of the Czar, aggregating nearly half a million of men, enjoys less changes of regiments, for the sake of change, than occurs in our little army of scarcely twenty-five thousand men.

In the fiscal year ending June 30, 1890, the Second and the Fourth Cavalry Regiments, the First and the Fifth Artillery, and the Seventh, Eighteenth, and Twenty-third Infantry Regiments changed their stations, involving in some instances movements from one side of the continent to the other. In addition to these movements of regiments, several batteries, troops, and companies effected changes.

In the fiscal year ending June 30, 1892, the First and the Tenth Cavalry, and the Ninth, Tenth, Eleventh, and Twenty-first Regiments of Infantry exchanged their stations for others, and fourteen batteries, sixteen troops, and twenty-nine companies were also changed.

In the fiscal year ending June 30, 1893, the Third and Fourth Artillery Regiments and the Third and Fifth Cavalry Regiments exchanged their stations for others, and twenty troops and twenty-two companies were also changed.

The cost of the exchanges made in 1892 amounted to about one hundred and ninety thousand dollars, and those made in 1893 to about one hundred and sixty thousand dollars, not including, in either case, credits passed to bonded railroads.

Probably the period for such extensive changes of stations, especially as those made during the year ending June 30, 1890 and 1892, is practically over in the United States, and a new and more economical, and possibly more desirable method may be adopted for the future.

General Grant gave an indication of such a method in General Orders No. 6, issued from the office of the adjutant-general of the army in 1869, which he characterized as "changes and transfers." Paragraph seven of this order provided that "the officers and enlisted men of the following regiments will be interchanged, company by company. The enlisted men will remain at the posts they now occupy. . . ."

This seems to afford a solution of all the difficulties which have heretofore presented themselves in the way of accomplishing a permanent and equitable system of exchange between the several regiments of the army. The adoption of the method of exchange contemplated by this paragraph of the order would, with slight modifications, enable the movements of regiments in pursuance of a general plan, one after the other in regular order, with sanitary conditions as a primary cause for the changes.

The method contemplated by the paragraph of the order referred to provided for the actual movement of the officers only, and their permanent transfer from one organization to another. It would have been more acceptable if it had been made to permit the officers to carry

with them the name of their organizations and the non-commissioned officers and all men who had served an enlistment in the regiment and had re-enlisted in the same. As thus amended the order would have been received with great satisfaction, and the system thus inaugurated would doubtless have continued to the present time.

Under this plan an exchange of stations would ordinarily be effected by requiring the regimental commanders, accompanied by their field officers, to proceed to their new stations with their adjutants and quartermasters, the non-commissioned regimental staff officers, and the records and colors of their regiments. At the same time each company commander would be required to proceed with his lieutenants and the non-commissioned officers, the men re-enlisted under him, and the records of his company.

All other enlisted men would be left behind, and transferred upon descriptive lists to the incoming organizations.

In discussing this subject in the September, 1892, number of the *United Service Review*, attention was invited to the fact that while this system is the only one that will afford a satisfactory and equitable method of exchange, it is by no means a complicated system, or in any manner difficult of accomplishment. It would be found simple and just in its operations, and would afford a practical solution of the subject of periodical exchanges.

It is possible that the object sought for might be as fully accomplished by the exchange of officers from one organization to another, as was practically contemplated by General Grant's order. But in such case it would probably be necessary to recommission the officers so transferred, and the character, achievements, and identity of the various organizations would thus be practically lost. It is hardly possible that all the advantages gained by a systematic exchange would compensate for such virtual disorganization. It is evident that the separation of the principal forces that have accomplished desirable characteristics in the several organizations would work permanent injury to the service, for which their transfer could afford no corresponding advantage. Separation of creative forces could only be desirable when favorable results have not been produced, and in such cases the separation could usually be accomplished by other means.

The officers virtually constitute the regiment, so far at least as its character and condition is concerned. They alone are identified individually with the history of their several organizations, and personally concerned with the legends upon their regimental banners. They alone give to the regiment whatever tone and peculiar characteristics it possesses. The interests of the enlisted men are embodied always in those of their officers, whoever they may be. The soldier is transient and dependent; the officer is permanent and responsible.

The enlisted man is discharged, ordinarily, at the expiration of his

three or five years' service, and usually takes himself away to new fields. During his short term of service he needs no change either for his own benefit or in the interests of the government. At the expiration of his term of service he gets a change at government expense, and goes elsewhere to engage in civil pursuits, or to enlist again in the army at his pleasure. The soldier thus has a change at stated periods of short duration, independent of his officers or company organization, and, as a rule, neither needs nor desires any other.

It would be rarely possible that the integrity or the efficiency of a regiment would be jeopardized by the system of transfer under contemplation. The majority of the men serve but one enlistment, and new men are added at stated intervals to repair the loss. The material of a company changes completely about every three years, and but an exception here and there of the old company remains.

In 1882 the government sent the Fifteenth Infantry from Colorado to Dakota, where it arrived during December of that year. The regimental return for the month named shows an enlisted strength of about four hundred men present with the companies. On June 30, 1884, eighteen months after the arrival of the regiment in Dakota, the casualties among the enlisted men aggregated three hundred and ninety-four. It seems apparent, therefore, that nearly every man in the Fifteenth Infantry transported from Colorado to Dakota in 1882, at an expense of several thousands of dollars, had left the regiment within a few months after the change had been effected.

It is not intended by these statements to imply that the losses sustained by the regiment would not have occurred if it had not changed its stations, though probably several were due to that cause, but simply to show how little was gained in point of service by the transportation of these men from one part of the country to another.

It is also worthy of consideration in this connection that these soldiers were by this movement carried farther away from the places where the majority had been enlisted, and that the government was compelled in consequence to pay an additional sum of transportation money to each man upon his discharge to cover this difference in distance.

In the matter of expense, and of good service as well, this movement has but little to commend it. Probably other movements of regiments in changing stations would afford similar deductions.

There seems to be but one serious objection that can be offered by regimental or company commanders against the proposed system of exchange. No one likes to turn over the fruits of his labor unrewarded for the benefit of another. He would prefer to reap his own harvest and profit by its fullness. After having built up a company to his own liking, in drill, and discipline, and appearance, the captain might feel it a hardship to give it up to another. Possibly, also, the recipient

might feel the same way, and both would be disgruntled by the change between them.

Fortunately, however, this objection is met and loses its force in the fact that a company is constantly undergoing changes by reason of losses and gains, and unremitting attention upon the part of the captain is necessary to maintain a high standard of excellence after it has been attained. The same energy applied to an entirely new, or at least a strange company, through the medium of non-commissioned officers, whom the captain will always be permitted to take with him, would soon bear fruit, and the new company would speedily become as satisfactory, doubtless, as the old one.

Examined from every possible stand-point, the advantages of the system proposed by General Grant, with the modifications suggested, are singularly apparent.

In the matter of public economy, in equity between regiments, in justice to the interests of individuals, this system commends itself as worthy of the highest approval.

It is evident that the exchange of the stations of regiments has in fact almost invariably been accomplished to effect a change for the officers. There is scarcely a case on record, either at home or abroad, of a change effected solely in the interests of the men. Great Britain moves her white regiments from India once in about ten years, for sanitary reasons. But she evidently does not make these changes on account of the men.

The average lifetime of a single enlistment for five years in the United States army, as will hereafter be shown, falls a little short of three years. The conditions that operate in the American army to produce this difference between the term of enlistment and the actual length of the service rendered are similar to those that operate in the British army, and doubtless produce the same results in that service. Using this ratio, therefore, as applicable to both armies, it is safe to assume that the period of actual service in the British army for the long term enlistment falls below five years, and for the short term below two years. Accepting these deductions as correct, it will be observed that the period of actual service of the British soldiers who go out originally with their regiments to India expires in all cases before the period of exchange arrives, and that new men sent to take their places have either gone or have just arrived when the regiment completes the required period of Indian service to entitle it to a change of stations.

The nearest approach to a change of stations in the British service in which the enlisted men were considered occurred in 1882 in the case of a battalion of the Coldstream Guards, sent to Canada for alleged insubordination. But, after all, the punishment inflicted upon this battalion was not directed so much against the men as against

the officers, who were responsible for the discipline in the organization.

In referring to the long periods which certain regiments in the American army have served continuously in given localities, we are often inclined to forget that, with but few exceptions, the officers only have served constantly at these places, and that during the periods named many changes have occurred among the enlisted men.

About one man in ten who enters the service remains in it and becomes a professional soldier. The others disappear after a single enlistment, or at most two. The adjutant-general of the army, in his report for 1893, states that during the previous five years the rolls of the army contained an average of two thousand seven hundred and seventy-two men who had served over ten years and less than twenty.

Under the five years' term of service the lifetime of the soldier is a little less than three years. Every twelve months more than one-third of the enlisted strength of the army must be renewed to keep its ranks full. The report of the adjutant-general for 1891 shows that seven thousand eight hundred and thirty-two recruits were accepted during that year. The report for 1892 shows the acceptance of nine thousand eight hundred and forty-seven, and that for 1893 the acceptance of nine thousand and seventy-four. Should the measure now pending before the Congress become law, and the term of service be reduced to three years, the lifetime of a soldier will be correspondingly reduced, and a greater number of changes than ever will occur among the enlisted men in the matter of losses and gains.

In view of the short term of the soldier's service, whether the five years' or the three years' system of enlistment is considered, it is evident that the exchange of stations in the interests of the enlisted men is unnecessary. Probably no permanent calling in the country affords the opportunity for so many and so frequent changes in location for the individual as that of the regular soldier. Every five years at most, and every three years as a rule, he finds himself at liberty to choose the place of his future service, and to make such changes in his affairs as he may desire.

The more the subject is considered the more evident it becomes that the exchanges of regiments are in fact made solely in the interests of the officers, and not in those of the enlisted men; for the permanent portion of the regiments, and not for the transient. Possibly the government had originally in view the exchange of stations of the enlisted men as well as those of the officers; but if so, its good intentions in this particular have been largely misapplied. If changes could be made by marching, as most of them were made a few years ago, some advantage might be expected from the experience thus gained; but unfortunately such changes are now seldom possible. On the contrary, after a long notification has been served, emigrant sleepers or railroad

coaches are provided to convey the men from one station to another, and the exchange is effected usually within a few hours after it has begun. It is all clearly well enough that ample time should be given for necessary preparation, and that every available comfort and convenience should be provided for troops *en route* under all circumstances; but it is apparent that unless the exchange can be accomplished by marching, it should in every case be confined to the officers and non-commissioned officers and re-enlisted men.

H. R. BRINKERHOFF,
Captain U.S.A.

ORIGIN AND DEVELOPMENTS OF STEAM-NAVIGATION.

(Continued from Vol. XI., page 552.)

1819.—The model of the first canal-boat on the Erie Canal exists at the Historical Society Rooms in Buffalo. It is about two feet long, sharp at either end, and is flat-bottomed. There are cabins at each end, between which are the gangways. It is a faithful and accurate copy of the "Chief Engineer of Rome," the first canal-boat that was built to navigate old Erie. The following card of explanation says the "Chief Engineer of Rome" was the first boat built for the Erie Canal, of which the trial trip was made October 23, 1819. Governor De Witt Clinton, the canal commissioners, and chief and assistant engineers, other State officers and guests, with ladies and gentlemen of Utica, Whitesboro', Oriskany, and Rome, in all about sixty or seventy persons, made up the party. The boat was named in compliment to Benjamin Wright, the chief engineer of the Erie Canal. The model, without the forward and middle cabins, was brought from England in the early part of 1817 by Canvass White, then assistant engineer to Mr. Wright, subsequently a distinguished engineer. The model was presented to the Society to which it now belongs, in February, 1867, by William C. Young, a rodman of the Erie surveys of 1816–17, a kinsman of the Whites of Whitesboro', in which family the original model-boat has been kept for years.

1819.—Great Britain owes to David Napier the establishment of deep-sea communications by steam-vessels, and of post-office steam-packets, at about the same date as the adventurous voyage of the "Savannah." Previous to his enterprise steam-vessels rarely ventured, and only in fine weather, beyond the precincts of rivers and coasts of firths. Soon after the introduction of steam on the river Clyde he entertained the idea of establishing steam communication on the open sea, and as a first step endeavored to ascertain the difficulties to be encountered. For this purpose he took passage, at a stormy period of the year, on a sailing-packet which formed one of a line and the only means of intercourse between Glasgow and Belfast, a passage which required a week to accomplish what is now done by steam in nine hours. The captain of the packet found a young man, whom he after-

wards knew as Mr. Napier, during one of his winter passages to Belfast, constantly perched on the bow of the vessel, fixing an intent gaze on the sea when it broke on the side of the ship, quite heedless of the waves and spray that washed over him. He only ceased from this occupation at intervals as the breeze freshened to ask the captain whether the sea was such that might be considered a rough one, and when told that it was by no means unusually rough, he returned to the bow of the vessel and resumed his study of the waves breaking at her stem. When the breeze began to freshen into a gale, and the sea to rise considerably, he again inquired of the captain whether the sea might now be considered a rough one, and was told that as yet it could not be called very rough. Disappointed, he returned again to his station at the bow and resumed his employment. At last he was favored with a storm to his contentment, and when the seas, breaking over the vessel, swept her from stem to stern, he found his way back to the captain and repeated his inquiry, "Do you call it rough now?" The captain replied "he could not remember to have faced a worse night in the whole of his experience," which delighted young Napier, who muttering as he turned away, "I think I can manage, if that be all," went down to his cabin. Napier saw then the end of his difficulties, and soon satisfied himself as to the means of overcoming them.

His next inquiry was as to the means of getting through the water with least resistance. To determine this, he commenced a series of experiments with models of vessels in a small tank of water, and soon found that the round full bluff bow adopted for sailing-vessels was quite unsuited for speed with mechanical propulsion of a different nature. This led him to adopt the fine, wedge-like entrance by which the vessels built under his superintendence were afterwards so distinguished.

In 1818 he established a regular steam communication between Greenock and Belfast by means of the "Rob Roy," a vessel of about ninety tons burden and thirty horse-power. She plied two winters between those ports with regularity and success, and afterwards was transferred to the English Channel as a packet between Dover and Calais. Having thus acquired steam navigation dominion of the open sea, Mr. Napier was not slow to extend it.

In 1819 the Messrs. Wood built for him the "Talbot," of one hundred and fifty tons, with two of Mr. Napier's engines, each of thirty horse-power, the most perfect vessel of her day in all respects, and a model which was long in being surpassed. The "Talbot" plied between Holyhead and Dublin, and conferred on Ireland the advantage of a direct, certain, and rapid communication with England.

Napier, in 1822, introduced surface condensers on board the "Post Boy," a steam-vessel built by him. The condenser consisted of a series of small copper tubes, through which steam passed towards the air-

pump. By a constant current of cold water encircling the pipes the steam was cooled and returned into water, which was again returned into the boiler for conversion into steam, without being mixed with the cold salt water, which in the ordinary plan was injected into the condenser. The rapidity of condensation was found insufficient, and he returned to the old system for condensation. Years afterwards he returned to this system, in circumstances which rendered it desirable, and, using flat plates instead of tubes, was more successful, and plied for years with no other condenser. In 1826 the first of the so-called leviathan class of steamers, the "United Kingdom," was built for the trade between London and Edinburgh. She was of one hundred and sixty feet long, with twenty-six and one-half feet beam, and engines of two hundred horse-power, built by David Napier. She was considered the wonder of the day, and people flocked from all quarters to inspect and admire her.

1819.—The first steamboats to ascend the Missouri were three little government boats in 1819. A party of engineers and naturalists kept along near them on shore. The Pawnees pilfered the horses, provisions, and apparatus of the unfortunate *savants*, and left them to wander, hungry and half naked, till they found refuge among the friendly Kaws. These steamers stemmed the current with difficulty, and were delayed by sand-bars; for this was before steamboats were educated up to walking off on their spars as a boy walks on his stilts; and on their return they dropped down river stern foremost, as they were more manageable in that position. One of the first boats to ascend the Missouri carried the figure-head of a serpent at her prow. Through this reptile's mouth steam escaped, and the savages when they saw it fled in alarm, fancying the spirit of evil was coming bodily to devour them.

FIRST STEAMER BETWEEN NEW YORK AND HAVANA.

In 1819 a vessel of seven hundred tons, named the "Robert Fulton," ship-rigged, but furnished with a steam-engine, was built at New York, to ply as a packet between New York, Charleston, Cuba, and New Orleans. She performed her voyage over that long route with great regularity in nine days, and continued running on it over three years. So far as safety and speed were concerned she was successful; but she did not defray expenses, and was sold to the Brazilian government, when her engine was removed, and she was converted into a cruiser. As late as 1838 she was in the Brazilian service.

The "Walk-in-the-Water," the only steamboat on Lake Erie in 1819, was considered sufficient to transact the commercial business of that lake. This boat, named after a Wyandotte chief, made her first trip to the island of Mackinaw in the summer of 1819. There was no one to furnish her with a cargo except the American Fur Company.

In 1827 the waters of Lake Michigan were first plowed by steam,

a boat having made an excursion to Green Bay; and in 1832 another steamboat reached Chicago with troops, that site being in course of clearance and settlement. In 1840 forty-eight boats were trading between Buffalo, Chicago, and other ports west of Detroit, the trip occupying fifteen days.

In 1820 the first steam-vessel was prepared for Ramsgate, and was called the "Eagle." She had two of Bolton & Watt's engines, equal to forty horse-power. She was in existence in 1850, and used by the King of Denmark as his steam-yacht. If a sailing-packet prior to the advent of steam conveyed to or from London and Ramsgate eight hundred passengers a month it was something extraordinary. Yet in November, 1850, the "City of London," steam-packet, conveyed five thousand three hundred and fifty-six persons.

1820–23.—The "Comet," "Lightning," and "Meteor" were the first steam-vessels that ever appeared in the British navy, and the "Comet" was the first that ever carried a pennant.

These sister vessels were constructed by Oliver Lang, then an assistant surveyor of the navy, in the year 1820, *the three surveyors in office having refused to take the responsibility of constructing a steam-vessel for sea service!* They were built at Deptford, in about three years, from Mr. Lang's drawings and plans of fittings, without the interference of any one, and solely under his direction and personal superintendence.

The following was the Admiralty return of their dimensions to the House of Commons, in answer to the inquiry of Rear-Admiral Sir Charles Napier, in 1846:

Name.	Guns.	Length.	Breadth.	Depth.	Class.	Horse-Power.	Engine.
		Feet.	Ft. In.	Ft. In.			
Comet . . .	3	115	21 3	11 11	Paddle	80	Bolton & Watt's side lever.
Lightning . .	3	126	22 8	13 8	"	100	"
Meteor . . .	3	126	22 8	13 8	"	100	"

The first *iron* steamboat ever built was constructed in 1820 at the Horsley Iron-Works. She was called the "Aaron Manby," after her projector. She was built in sections and put together in London, and was the first vessel that ever went direct from London to Paris.

In 1820 there was only *one* small steamboat on Lake Erie. In 1831, *eleven* steamboats, with an aggregate capacity of two thousand two hundred and sixty tons. In 1836, forty-five steamboats, of nine thousand one hundred and nineteen tons. In 1847, sixty-seven side-wheel steamers and twenty-six screw steamers.

In 1822, Messrs. Wood built on the Clyde the "James Watt," to ply between Leith and London. She measured four hundred and

forty-eight tons and carried two engines of fifty horse-power each, made by Bolton & Watt, under the superintendence of Mr. Brown, one of the firm. The "James Watt" was remarkable for having its paddles moved through the interposition of toothed wheels, and not directly by the engine; so that the revolution of the axis of the engine was greater than that of the paddles. With the exception of the low proportion of power to tonnage, the "James Watt" possessed nearly all the qualities of the most improved vessels of a quarter of a century later.

FIRST STEAMBOATS ON THE INDUS.

1820.—A small steamboat christened the "Snake" was built in Bombay in 1820, and was the first steam-vessel on the Indus, and, in fact, on any river in India. Her engines were designed and built by a Parsee, and were the first ever manufactured in India. How well they were constructed is evidenced by their lasting powers. She was twice wrecked,—once in a hurricane in 1837, and again in a cyclone in 1854. She was employed during the first British Burmese war and on the expedition to the Persian Gulf from 1823 to 1826, in the Chinese war of 1841–42, Burmese war of 1852, Persian war of 1856, mutiny of 1857, Chinese expedition of 1859, etc. She in her day carried most of the notables that arrived in India *via* Bombay, and closed her eventful career of sixty years in 1880, when she was broken up.

The "Falcon" in 1820 used steam during part of her voyage from England to India.

A steamboat was launched at Potsdam in 1820, larger than any yet built in Europe. It was two hundred feet long and forty-four feet wide, had two engines of twenty horse-power each, and was named The "Blucher" with great ceremony.[1]

Impressed with the importance of having steam ships of war as early as 1820, the French government sent two officers to America, Captain Mongery, of the navy, and M. Marestier, of the corps of marine engineers, to ascertain and report upon the properties of the steam-vessels of the United States, and their report was printed.

In 1820–21 an unsuccessful attempt was made by Boston ship merchants to establish steam towage on the rivers of South Carolina. A company was formed with a capital of twenty-five thousand dollars, and afterwards increased. A steamboat called the "Patent" and towing-barges were built and sent out to ply on the Pedee and Santee Rivers, but, as appears by a letter to Thomas H. Perkins, Esq., from John L. Sullivan, dated Troy, January 1, 1823, the enterprise resulted in the loss of the capital invested and its abandonment. It is worthy of note only as showing that thus early an attempt was made to in-

[1] *Literary Gazette*, February, 1820.

augurate steam navigation on the rivers of the Southern Atlantic coast of the United States.

1821.—The first sea-going steamboat sent out from Hull, England, was in 1821, and is reputed to be the first sea-going steamboat on the east coast of England. In 1854 the sea-going steamers connected with Hull had an aggregate tonnage of nine thousand one hundred and thirty-nine, and the river-boats two thousand two hundred and eighteen tons; other steamboats coming to and departing from Hull had a burden of five thousand nine hundred and nine tons; altogether there were eighty steamers trading with Hull, fifteen of which were screws.

In 1821 there was an excursion from New York to Providence in the steamboat "Robert Fulton,"[2] the first of its kind. The *Manufacturers' and Farmers' Journal* of August 27, 1821, has the following notice of the event:

"The 'Robert Fulton' left New York Thursday afternoon at five o'clock, and arrived below at nine Saturday morning. As soon as the tide would permit she came up to town, where she was the admiration of crowds of visitors. She brought eighty passengers, among whom was the *Hon. John Quincy Adams, Secretary of State*, who immediately proceeded to Boston by land. At two o'clock the 'Fulton' departed on her return to New York."

The journal of one of the passengers supplies further particulars of this interesting trip. He says,—

"On Friday, at a quarter before 8 P.M., we ranged alongside of the dock at Newport, music playing as we entered the harbor and passed the fortified island. Such a scene of tumult as was here witnessed I never saw before. The wharves were lined with people of all ages and conditions, who pressed forward and immediately on our landing took complete possession of the ship. The band and many of the passengers went on shore, and Governor Gibbs and some of the principal families in town were serenaded. When the party returned to the ship they were scarcely able to get on board, and the tumult lasted until one o'clock in the morning.

"We started at 5 A.M. next day for Providence. As we approached the scene became truly interesting. The inhabitants had anticipated our arrival, and every hill was covered with an admiring assemblage. India Point wharf presented a spectacle singular and gratifying. The beauty and fashion of this charming town greeted us with cheers and welcoming. At 7.45 we came up to the dock and landed the company, and here again numerous parties of ladies and gentlemen crowded the ship. The masts and rigging of the vessels lying in the vicinity were covered with spectators, and nothing could exceed the interest and gratification with which all appeared to greet

[2] This was not the New York and Havana packet already mentioned, but a steam-vessel of the same name built exclusively to navigate Long Island Sound.

our arrival. At 3 P.M. the 'Fulton' left the wharf amid the shouts of thousands.

"We arrived at Bristol at half-past 5 P.M., where we were met with the same spirit of enthusiasm which had characterized our whole route. Mr. De Wolfe's elegant mansion was thrown open to the visits of the passengers, and was much admired. We arrived at Newport at 8 P.M. It was quite dark, but the interest appeared to have increased rather than diminished. I took a station at the gangway to assist the inhabitants, and particularly the ladies, on board the ship,—notice having been given that none but ladies would be allowed on board at first,—and in the short space of twenty minutes I handed in three hundred and thirty-seven. I found that this number did not appear to have thinned the crowd in the least degree, and by nine o'clock there must have been on board upward of six hundred ladies."

EARLY STEAMBOATS ON LONG ISLAND SOUND.

After the "Fulton" steamed away, no steamboats came from Providence until the 6th of June, 1822, when the "Connecticut," Captain Bunker, arrived from New York.

On the 12th of July, of this year, a company was formed, called the "Rhode Island and New York Steamboat Company," and regular trips, twice a week, were begun between the two cities by the "Fulton" and "Connecticut."

The New York Legislature had granted great privileges to the Livingston and Fulton Steam Navigation Company. No steam-vessel could navigate New York Bay, the North River, Long Island Sound, or any of the lakes and rivers of the State of New York without their license. The Connecticut Legislature antagonistically enacted "no vessel bearing such a license should enter any water within that State." The "Connecticut" was running at this time between New York and New Haven in opposition to the packet lines. Through the influence of the packet-owners the Legislature of Connecticut passed a prohibitory law, and the "Fulton" and "Connecticut," running between New York and New London, were driven from Connecticut ports.

The Providence *Journal*, June 3, 1822, copies from the New York *Mercantile Advertiser* the announcement that steam communication between New York and New Haven had ceased, and states that the "Fulton" and "Connecticut" had sailed for some point in Rhode Island. June 6 the arrival of the Connecticut was announced in the "marine news," and July 12 the "Fulton," Captain Law, arrived at Providence from Pawcatuck. The same day the "Connecticut," Captain Elihu S. Bunker, and "Fulton" began regular trips between Providence and New York, touching at Newport. The fare between Providence and New York was *ten* dollars; between Newport and New York nine dollars. The first advertisement of this company appeared

under the cut of a *man-of-war with port-holes open and every sail set,*— in a few weeks a steamboat cut was procured, and then the advertisement announced that

"*From New York* a boat will depart on Wednesday and Saturday at 4 o'clock P.M., and

"*From Providence* a boat will depart on Wednesday and Saturday at 6 o'clock A.M."

The "Fulton" and "Connecticut" continued their weekly trips through the season, and thus was inaugurated the steamboat trade between Providence and New York. The log of the first trip of the "Connecticut" is in substance: "Left New York on the 4th at 4 P.M.; was detained at Sandy Point 8½ hours by easterly winds; on the 5th continued our voyage, and arrived off Fisher's Island at 8 P.M. Lay to 3 hours; doubled Point Judith at 2 A.M.; touched at Newport, and arrived at Providence at 8 A.M. on the morning of the 6th of June." During the autumn of 1822 the amount of travel and rate of speed between New York and Newport were: September 13, "Fulton," 27 hours from New York, 40 passengers; October 4, "Connecticut," 32 hours, 40 passengers; October 6, "Fulton," 24 hours, 26 passengers; October 10, "Connecticut," 18 hours, 35 passengers. The "Fulton" withdrew for the winter November 16, but the "Connecticut" was continued on the line, making one trip per week until the navigation was closed by the ice. The following announcement reads queerly now:

"The 'Connecticut' will leave Providence every Tuesday evening to go down the river, in order to start from Newport at an early hour on Wednesday morning. *It will therefore be necessary for the passengers to be on board at Providence at ten in the evening.*"

The "Connecticut" and "Fulton" were owned in New York. The "Connecticut" was one hundred and fifty feet long, twenty-six feet wide, and of about two hundred tons burden. Her color was white, with green trimmings. She had a square engine, and cost eighty thousand dollars.[3] The "Fulton" was the first steamboat built expressly to navigate Long Island Sound. She was enormously strong, but had little less machinery than is now put in a cotton-mill. Her wheels were turned through a cog-wheel with teeth five inches long. She made a terrific noise when in motion, but moved so slowly that she was once five hours going from Providence to Newport. Her color was black, and she had sails to help the steam. Her captain once told with glee he had come all the way from New York without hoisting his sails.

Neither boat had upper saloon, state-rooms, or hurricane-deck. Both boats burned pine wood under large *copper* boilers, which were kept polished to the last degree of brightness. The wood necessary to keep the steam up during the trip between Providence and New York

[3] She afterwards ran between Portland, Maine, and Boston, Massachusetts.

was piled everywhere, fore and aft, and high above the guards. But little freight was carried, as the wood took up nearly all the room. When, years afterwards, coal was introduced, iron boilers were substituted, and the old copper boilers paid for the new iron ones.

In the spring of 1823 the "Connecticut" and "Fulton" resumed their trips. The "Fulton" had been overhauled and improved, so that she was nearly as fast as the "Connecticut." She made her first trip to Providence on the 12th of May, 1823, and brought fifty passengers. When near Field's Point one of her boilers was discovered to be "partially ruptured." The fires were hauled and the boat anchored all night. In the morning she was taken to Providence, and five days afterwards was again on the line.

No sooner was the line again in operation than the packetmen caused to be introduced in the General Assembly of Rhode Island a Prohibitory Bill, which restricted the landing of steamboat passengers on Rhode Island soil, and a bill imposing a tax of fifty cents upon each passenger by steamboat. The tax bill passed the Senate, but was rejected by the House, the measure being decided unconstitutional. Consideration of the other bill was indefinitely postponed.

During the season of 1823 the "Connecticut" and "Fulton" made regular trips between Providence and New York, leaving Providence Wednesdays and Saturdays at 6 A.M., and New York Wednesdays and Saturdays at 4 P.M. The advertisement announcing this programme concludes with the remark, "Travelers are requested to read the above notice right."

As the "Connecticut" approached Nyaot Point one June morning in 1823, two skiffs were observed making for the steamer. The occupants seemed to signal the vessel to stop, and such interest was aroused that Captain Bunker steered towards the foremost skiff and hailed her. There was returned no answer, but from the rear boat came oaths and shouts from which those on the steamer gathered that the occupants of the foremost boat were runaways in pursuit of some Gretna Green. As their boat came within a few yards of the steamer a young man looked up and said, "Will you take us on board, sir?" An enthusiastic response from the passengers, and a score of hands lent their aid. Captain Bunker seemed unconscious of what was going on, but tradition says that the instant the young man's feet touched the deck of the steamer the engineer received an order to "*go ahead*" with a suddenness that took away his breath; and in a very few seconds a wide stretch of water lay between the steamer and the empty boat.

The following table exhibits the average and comparative length of the voyages of steam- and sailing-vessels between British ports and those of surrounding seas, as reported to the British Parliament in June, 1822:

Ports.	Steam-Vessels. Hours.	Sailing-Vessels.	Distance. Miles.	Ports.	Steam-Vessels. Hours.	Sailing-Vessels.	Distance. Miles.
Holyhead to Dublin . .	8	70 hours	55	Brighton to Dieppe . .	9	30 hours	73
Pt. Patrick to Donaghadee	3	8 "	19½	Southampton to Havre	15	36 "	120
London to Leith	55	5 days	429	" Guernsey	16	37 "	125
" " Dublin . . .	84	16 "	610	Milford to Waterford .	11	25 "	81
Dublin to Liverpool . .	14	36 hours	131	Greenock to Belfast . .	13	30 "	90
Greenock to Liverpool .	24	13 days	224	" to Glasgow, up .	3	12 "	24
London Bridge to Calais	12	36 hours	120	" " " down	2¼	6 "	
London to Margate . . .	8	20 "	84	" " Dublin	25	52 "	200
" " Plymouth . .	38	10 days	315	" " Ayr	6	12 "	48
" " Belfast . . .	110	18 "	725	" " Largo	2	4 "	18
" " Ostend . . .	12	24 hours	90	" " Port Patrick .	9	20 "	90
" " Texel	22	54 "	170	" " Isle of Man . .	18	40 "	135
" " Scarborough	25	68 "	225	" " Cambeltown .	16	18 "	67
" " Portsmouth .	29	8 days	255	Edinburgh to Aberdeen	12	25 "	90
" " Hull	23	50 hours	215	" " Sterling .	4	8 "	36

1823.—In 1823 there were about three hundred steamboats on American waters.

Between 1813 and 1823 one hundred and sixty steam-vessels were launched in England, varying all the way from nine to five hundred and ten tons in size, and from three horse-power to one hundred and twenty. The largest of these, the "Soho," was of smaller dimensions than the American steamboat "Chancellor Livingston," of five hundred and twenty tons, plying on the Hudson River between New York and Albany, and she was surpassed by the "Lady Sherbrooke," of seven hundred and eighty-seven tons, the largest then plying upon the St. Lawrence.

In 1822, David Gordon, of London, obtained a patent for certain improvements and additions to steam-packets applicable to naval and marine purposes, which consisted in boxing the paddle-wheels, or inclosing them in a case, by which plan the vessel can be easily made proof against shot.

In 1823, Captain Delisle addressed a letter to the French Minister of Marine, in which he proposed applying to ships of the line four screws of five arms each, of which two were to be placed in the bow and two in the stern of the ship. He gave the proportions of the length of the furrow of the screw to its diameter at 1.85. He also gave plans for raising the screws out of water and unshipping them while immersed,—that it might not impede the vessel while under sail.

Wickoff in his "Reminiscences of an Idler" mentions in 1823 that "a steamboat nicknamed 'Old Sal' ran daily in summer from Philadelphia to Bristol, some twenty miles, a distance which was usually accomplished in three hours," and that "a sensation was created in Philadelphia when a steamboat appeared called the 'Trenton' that ran to Bordentown, some twenty-six miles, in two hours and a half." Passengers then took stages to New Brunswick, when another steamboat carried them to New York. "With luck the journey was per-

formed in twelve hours, but terrible work it was in the heat of summer. In winter the only route to New York was by land, the rivers being closed with ice."

1822.—EARLY STEAMBOATS IN MAINE.—The first advertisement or notice of a steamboat in Maine is found in the Portland *Argus*, August 13, 1822, viz.:

"The steamboat 'KENNEBEC' will leave Union wharf at four o'clock for North Yarmouth to spend the day. Will return on Thursday to take passengers to the Island as usual. If required, will stop at Week's wharf to receive and land passengers. Will also, should sufficient number of passengers apply, go to Commencement the day preceding, and also on the day of Commencement. For tickets apply to Mr. A. W. TINKHAM'S store."

Lewis Pease, constable and bank messenger and local poet, records her advent thus:

"A fig for all your clumsy craft,
Your pleasure boats and packets,
The *Steamboat* lands you safe and soon,
At Mansfield's, Trott's, or Bracket's."

This pioneer boat was the old hull of a flat-bottomed craft, in which Captain Seward Porter, the father of steam navigation in Maine, had placed a small, imperfect engine for excursions in the bay. His enterprise was so successful that two years later we find the following notice in the Portland *Argus* of July 8, 1824:

"The steamboat 'Patent,' Captain Seward Porter, arrived here yesterday, in four days from New York, having touched at a number of places to land passengers. She is intended to ply between this place and Boston, is strong and commodious, and elegantly fitted for passengers. Her engine has been proved, is of superior workmanship, and propels the boat about ten miles an hour. From the perseverance of Captain Porter we have no doubt but he will meet with good encouragement and find it profitable. We wish him success."

In a report made to the stockholders she is described as of two hundred tons and as costing twenty thousand dollars. She had one mast, and a staff at her stern, from which was displayed the stars and stripes, a flag which, in 1832, was in the possession of Hon. William Gould, of Windham, Maine, to whom it was presented by Captain Porter in 1831.

The "Patent" was low and without a hurricane-deck; her boiler and engine were below, and she had a heavy balance-wheel half above the deck, and an arrangement by which the paddle-wheels could be disconnected. It was said her engine had been built for a vessel to go to Russia (?). Her cabins were all below. The ladies' cabin was at the stern, but had no skylights on deck; the entrance to it was through the gentlemen's cabin. The stern broad quarter-deck was clear with

seats all around it. In the Boston *Courier* of August 12, 1824, her arrival on the 8th is noticed from Portland in seventeen and a half hours against a head wind with seventeen passengers.

In 1824 a small boat was built at Bath called the "Waterville," to run on the Kennebec River.

In 1825 the "Maine," built of the hulls of two schooners, with beams across, was fitted out in Bath. She was of one hundred and five tons, and cost thirteen thousand dollars. The fare between Boston and Portland, with meals, was $5.00; to Bath, $6.00; Augusta, $7.00; and Eastport, $11.00.

1826.—The steam-brig "New York" was running on the coast in 1826, and was lost three years after. A short time previous to her loss she had been purchased by Mr. Bartlett, of Eastport, and fitted with new machinery, etc., running regularly between Boston, Portland, Bath, and other ports on the coast, and while on a trip, and near Owl's Head, came in collision with another steamboat and the next day took fire. We learn from the statement of a passenger:

"Nothing material occurred until she ran on shore going up the Kennebec. She was got off on the next tide, and proceeded to Bath, where passengers were landed and received. She then sailed for Belfast; in the evening, near Owl's Head, she met the steamer *Patent* from Belfast to Portland; both vessels came in contact, and the *Patent* receiving injury was taken in tow by the *New York*, and returned to Belfast. The *New York* then proceeded to Eastport, having about thirty-two souls in all on board. On the same evening, between nine and ten o'clock, about eight miles to the eastward of Petit Menan Light, a glimmering light was discovered around the port funnel. Only two men were on deck, viz., one at the helm and one at the bow. No engineer or fireman was at his post, and but one bucket could be found on deck. Before assistance could be had the fire had got the upper hand, and the engineer could not stop the machinery.

"No fire-engine, hose, or buckets could be found to throw a drop of water. The passengers escaped in the boats, and landed about midnight at the light-house, and from thence to the mainland."

The "New York" had full round lines, flush deck, long scroll-head, like the packet-ships of that day; her name painted on the paddle-boxes, with the addition "New York and Norfolk Packet."

Captain Churchill, her commander, was known as a first-class sailor and coaster, and by his familiars was called "Old Churchyard."

1824.—FRENCH PATENT.—In 1824, L. A. Delangue, of Paris, France, patented a mode for propelling vessels and boats on rivers, by means of Archimedes's screw, placed horizontally, and put in motion by a steam-engine.

A. A. Geerault, of Paris, patented a system of oars moving in a vertical direction, applicable to the navigation of steamboats, and G.

Heath, of Paris, a method of keeping a boiler always full of water by condensing the steam.

1825.—First Steamer to Calcutta.—The steamship "Enterprise" made the passage from London to Calcutta, and inaugurated the communication of England with India by steam. The "Enterprise" was a vessel of four hundred and seventy tons burden, having engines of one hundred and twenty horse-power. Commanded by Lieutenant Johnson, R.N.,[4] she sailed from Falmouth, August 16, 1825, and arrived in Diamond Harbor, Bengal, on the 7th of December, having achieved a distance of thirteen thousand seven hundred miles in one hundred and thirteen days, of which she was sixty-four days under steam, thirty-nine under sail, and ten at anchor. The "Enterprise" was built by an association of gentlemen, and was sold to the government of Bengal for forty thousand pounds, which, together with the passage-money, nearly paid her first cost. She was employed in the Burmese war with advantage, and on the occasion of the treaty of Malowa saved the government six lacs of rupees by reaching Calcutta in time to prevent the march of troops from the upper provinces.

1825.—Jacob Perkins, February, 1825, applied a propeller eight feet in diameter at the side of the rudder of a canal-boat. It was built like a double set of windmill vanes, the solid axle of one set working the hollow axle of the other, and rotating in opposite directions.

1825.—A vessel was also built at Rochester the same year by the Canal Towing Company, fitted, on the plan of Samuel Brown, with a gas vacuum-engine of twelve horse-power, working by means of beveled gear a *two*-bladed propeller at the bow. The blades were at an angle of ninety degrees to each other, and forty-five degrees to the axis.

Another vessel, with similar engine and propeller, was soon after tried on the Thames, and attained a speed of seven miles per hour.

1826.—The following hand-bill, if compared with others of the present time, will show the improvement that has been made in the North River boats during the past half-century:

"HUDSON RIVER STEAMBOAT LINE.

"Constitution, Constellation,
"Captain W. J. Wiswell. Captain R. G. Crittenden.

"DAILY.

"These new and splendid Boats will be dispatched Daily from New York and Albany, during the Summer months, commencing their regular trips, under this arrangement, on Monday, the 5th June: leaving

[4] Captain Johnson received ten thousand pounds for making the first steam voyage to India.

the wharf, foot of Cortland Street, New York, at 10 A.M., and the wharf, near the steamboat office, South Market Street, Albany, at 9 o'clock.

"When practicable, the Boats will come to at the wharves at Newburgh, Poughkeepsie, Catskill, and Hudson. At Rhinebeck and Kingston a convenient barge will constantly be in readiness to receive and land passengers.

"At the other intermediate places passengers will be received and landed whenever it can be effected with safety.

"These boats are of the first-class, and for extensive and airy accommodations, speed, and quiet motion of engines, and skilful management, are not surpassed by any boats navigating the Hudson River, and the proprietors assure the public that the most assiduous attention will be paid to the safety and comfort of passengers.

"Agents for this line:

A. N. HOFFMAN, No. 71 Dey Street, New York.
A. BARTHOLOMEW, South Market Street, Albany.

"☞All freight and baggage at the risk of owners. Freight of light articles, one shilling per cubic foot.

"May 23d, 1826."

1826.—November 18, 1826, Bennett Woodcroft patented a screw-propeller in England.

1827.—The following advertisement of a steamboat winter line between Philadelphia and New York is from a Philadelphia newspaper dated February 8, 1827:

"STEAMBOAT WINTER LINE FOR NEW YORK,

And the only one now running between the two Cities. Through in one day. Two Citizens' Line Coaches leave their office, No. 32 North Third street, nearly opposite the City Hotel, every morning (Sundays excepted) at 4 o'clock; breakfast at Vencleu's City Hotel, Trenton; dine on board the steamboat, under way from Perth Amboy, and arrive in New York early the same afternoon. Fare through, $6.

"For seats, apply at the above Office, Citizens' Line office, No. 23 South Third street, sign of Robinson Crusoe, and at the office of the Reading and Bethlehem Mail Stages, A. M'Calla's, White Swan, Race street.

"☞ All baggage at its owner's risque."

1828.—The steamship "Atlas," launched at Rotterdam in the summer of 1828, had three engines of one hundred horse-power each, and four masts. Her decks were thirty-five feet longer than a first-rate man-of-war, and she was described as "a gigantic steam-vessel, the largest ever built."

1828.—First Steamer in Turkey.—The first steamer ever seen in Turkey, the "Swift," arrived at Stamboul May, 1828. This solitary boat was purchased by an American and two or three others for three hundred and fifty thousand piasters, and was presented by them to the Sultan Mahmoud.

1828.—The "Curaçoa."—It seems probable that the sight of the "Caledonia," which James Watt, Jr., brought early in 1817 from the Clyde to take up the Rhine, staying a little while at Rotterdam, stimulated the interest of the Dutch in steam navigation; at any rate, they soon after ordered several small steamers from Scotland, and in 1827 a company of the merchants of Amsterdam and Rotterdam united for the hazardous experiment of running steamships between the Netherlands and the West Indies. Accordingly, they had a steamer built on the Clyde, which they named the "Curaçoa," of three hundred and fifty tons and one hundred horse-power, and dispatched her, in the summer of 1829, from Amsterdam to the Dutch West Indies. Another account says she started from Antwerp on her first trip August 12, 1828. The voyage to Curaçoa and from Antwerp was repeated several times with great commercial success; nevertheless, the enterprise soon came to an end.

December 10, 1828, Charles Commerow patented a perfect one-turn screw propeller or spiral, fixed parallel to the keel, the outer bearing being held by a second sternpost, behind which was the rudder.

1829.—Temperance on Long Island Sound.—At a meeting of the directors of the Chancellor Livingston Steam-Packet Company, in 1829, a resolution was adopted prohibiting the steward from placing decanters of brandy and spirits upon the tables. This action created a tremendous stir. As previously stated, the cuisine on the "Chancellor" had always been superb. In these meals the decanters had played an important part; to banish them was atrocious. The indignation was strong, and a letter in defense of the action was published. That letter said "the directors were not influenced by petty motives of economy or gain, but hoped to do a little to aid the cause of reform," and concluded as follows:

"The tables are now supplied with red wines of good quality and pleasant flavor, as well as a good tendency in its effects upon those who may be affected by the motion of the boat. In addition to all this, whenever any person may choose to order brandy or spirits from a belief of their necessity, it will be immediately and cheerfully supplied from the bar, and the gentleman will hear no more about it unless he pleases."

This sensible and moderate movement in favor of reform finally received the approval of all persons of true discernment.

1829.—November 29, 1829, Benjamin Smith, of Rochester, New York, obtained a patent "for propelling boats on the water by the

application of sculling wheels, or a screw propelling wheel, formed like the wheel of a smoke-jack, and fixed at the *stem* or bow of the boat by means of a shaft running through the centre, and worked by any suitable power." July 10, 1830, a Mr. Doolittle, being at Syracuse, saw a steamer with wheels of this description arrive on the canal from the West.

1830.—February 4, 1830, John M. Patten, of Milton, Pennsylvania, patented "a spiral or screw-wheel" (described by him as an old invention).

May 22, Josiah Copley, of Warner Mark, Pennsylvania, patented "a shaft having affixed to it eight or any other number of vanes or fans, forming segments of spirals. These to be placed under water, parallel with the keel, and a rapid rotatory motion to be given to them.

October 1, Felix Peltier, of New York, patented "a screw placed in a horizontal position, and wholly uncovered or naked, whether formed of a single spiral wound round a solid arbor and cutting at constantly equal angles, or whether its inclination vary, and whether the spiral be of one or the same breadth throughout, measured from the arbor."

1830.—EARLY STEAMSHIPS OF THE FRENCH NAVY.—The Minister of the French Marines in 1830 announced that the arrangements for the transformation of the cannon foundry of the island of Indret, on the Loire, into an establishment for the supply of engines for the use of the steamship dock-yard at that place, commenced at the close of 1828, were then sufficiently advanced to be in active operation.

This steam dock-yard had already fitted out "Le Pelican." She had *four* wheels and four engines of sixty horse-power. The machine was made at Indret. Two steam-frigates, viz., the "Castor," and "Crocodile," were building, calculated to draw twelve feet of water. Their length on deck was one hundred and sixty-one English feet, keel one hundred and fifty feet, extreme breadth thirty-six feet four inches, breadth amidships twenty-five feet. They were to be armed with six 24-pound carronades, and three of Paixhan's new guns, carrying a hollow twelve-inch shell shot. The French had nine armed steamships afloat in 1830, and nine under construction. A writer in the *United Service Journal* in 1831 says, "It is really surprising—melancholy—to find there is not one steam man-of-war on our (the Royal) Navy list,"—"the construction of engines has not even commenced in our dock-yards."

1830.—FIRST STEAMER ON THE DANUBE.—The first attempts to navigate the Danube by steam were made by French and German engineers, who were so confident of success that they did not even try the vessel, but before trial, invited the Emperor Francis I. to honor them with his presence on their first trip to Pesth. His Majesty embarked, and a favorable passage was made *down* the stream. On

arriving at Pesth with the emperor on board the vessel created no little sensation; salutes were fired from the batteries, the curiosity was intense, and to celebrate the great event public balls and other festivities were given. At the end of these joyous proceedings His Majesty intimated his intention of returning to Vienna. But when orders were given to "go on with all speed" it was found the engines had insufficient power, and that the stream was carrying the boat *down* the river. All attempts to propel the boat against the current proving inefficient, His Imperial Majesty was obliged to land and proceed to Vienna through a country where the roads were so bad that his carriage frequently stuck fast in the mud.

In 1830, Mr. J. Pritchard, an Englishman, succeeded in conquering the Danube, and passing the rapids of Floresdorf in his steamer, returned to Vienna, where his vessel was visited by the imperial family and permission given to name her the "Francis the First." A concession was granted to Mr. Pritchard by the Austrian government for the exclusive right of carrying on steam navigation on the Danube for fifteen years.

1830.—First English Mail Steamer.—The first English steamship to carry foreign mails was the "Meteor." The *United Service Journal* for 1830 says, "It has long been contemplated for the conveyance of the foreign mails. H. M. steam-vessel 'Meteor,' Lieutenant William H. Symons, is to proceed to the Mediterranean on this service. The first adoption of steam in the conveyance of the foreign post-office mail has taken place. H. M. steam-vessel 'Meteor,' Lieutenant William H. Symons, left Falmouth February 5, for the Mediterranean. We look on this as an era in steam navigation which bids fair to introduce its more general adoption for the purposes of government."

1830.—First Steamer on the Red Sea.—The Hon. East India Company's armed steamer "Hugh Lindsay," Captain Wilson, of four hundred and eleven tons burden, and two engines of eighty horse-power each, arrived at Suez, April 20, 1830, from Bombay. She was the first steam-vessel that ever navigated the Red Sea. It had been for some time a favorite object of Sir John Malcolm, the governor of Bombay, to establish a steam conveyance for dispatches between that place and England, and the "Hugh Lindsay" was built for the purpose at a cost of forty thousand pounds; yet the blunder was committed of her having only the capacity to carry six days' coal. In consequence the "Hugh Lindsay" was thirty-three days in reaching Suez from Bombay, having lost twelve days in the ports of Aden, Mocha, Jiddah, and Cosseir, coaling.

The letters sent by her reached England in less time than any ever received before from India. Colonel Campbell was the only passenger by her, from want of room, as the cabin and every other available

place was occupied by coal. She was so deep in the water on leaving Bombay that she was *à fleur d'eau*, and her wheels could hardly revolve. The distances between the several places on her route are: From Bombay to Aden, 1710 miles; from Aden to Mocha, 146 miles; from Mocha to Jiddah, 556 miles; from Jiddah to Cosseir, 430 miles; from Cosseir to Suez, 261 miles, which at twenty days' navigation is 155 miles a day, or six miles and a fraction per hour. She was the first vessel that made so long a voyage entirely by steam.

A letter from the captain of the "Hugh Lindsay" details this the first attempt to establish a steam conveyance upon the Red Sea, where the Lord opened a path for the Israelites of old, and where Pharaoh and his host so miserably perished:

"Hon. Company's Armed Steamer 'Hugh Lindsay,'
"Suez, April 22, 1830.

"Sir,—I have much pleasure in acquainting you with the arrival of the 'Hugh Lindsay' at Suez this day from Bombay, which place she left 20th of March. The passage has occupied more time than was expected, owing to the delay occasioned by receiving coal at Aden and Jiddah. At the former place we were detained *six* days, and at Jiddah five. We also touched at Mocha, which detained us a day. The present trip being an experiment, I was instructed, if time permitted, to visit you at Alexandria, for the purpose of communicating with you on the subject of steam navigation in the Red Sea; but the season being now so far advanced, it is necessary we should use the utmost dispatch to insure our return to Bombay previous to the setting in of the southwest monsoon, for which reason we shall leave Suez as soon as we have received what coal there is. We touched at Cosseir to take what fuel was there also, and we are apprehensive we shall find scarcely enough on the Red Sea to take us to Bombay.

"The 'Hugh Lindsay' is four hundred and eleven tons burden, and has two eighty horse-power engines. By the builder's plan, she appears to have been intended to carry about six days' coal; but in order to make the passage from Bombay to Aden she was laden as deep as could be, and left with her transom in the water. Notwithstanding, on our arrival at Aden after a passage of eleven days, we had only about six hours' coal remaining, which circumstance alone shows her unfit for the performance of the passage. Her being so deep, too, materially affected her speed. I met with greater detention in getting off coal at Aden and Jiddah than I had anticipated. Arrangements might be made to expedite the shipment of coal at those places, but I am now of opinion the fewer depots the better, and that if steamers were built of a class that would be propelled by engines whose consumption of coal would not exceed nine tons in the twenty-four hours, and which should carry conveniently fifteen days' coal at that rate of consumption, then the

navigation of the Red Sea would be best carried on in two stages, one from Bombay to Aden, and from thence to Cosseir or Suez direct. I think, too, there is no necessity for proceeding up as far as Suez, as every object might be equally well attained by going to Cosseir only. As far as the passengers are concerned, the majority, I should suppose, would prefer being landed at that place, for the purpose of viewing the antiquities on the route from thence to Alexandria, and the arrival of dispatches would be very little delayed when we take into account the time occupied by a steamer on going from the parallel of Cosseir to Suez, which, when northwest winds prevail, could not be done in less than two days and a half.

"I inclose a copy of the log of the 'Hugh Lindsay' from Bombay to Suez, conceiving it might possess some interest as the journal of the first steam-vessel which has ever navigated the Red Sea.

"I am, sir, etc."

1831.—April 23, 1831, Giraud patented in the United States "a screw or spiral lever for propelling."

1831.—THE FIRST STEAMER TO CHICAGO.—The first steamer arrived at Chicago, Illinois, in 1831. Nothing could exceed the surprise of the sons of the forest on seeing this steamer move against wind and current without sails or oars. They lined the shores and expressed their astonishment by repeated shouts of "*Taiyoh nichee!*" an expression of surprise. A report had been circulated among them that a "big canoe" would soon come from the noisy waters, which by order of the Great Father of the "Chemo Komods" (*Yankees*), would be drawn through the lakes and rivers by a sturgeon, and this served to verify the report.

1832.—IRON STEAMBOATS.—March, 1832, Bennett Woodcroft patented a screw formed by a circular line coiled round a cylinder, increasing the pitch throughout the length and producing greater speed with fewer revolutions, to be fixed forward of the middle post by cutting away part of the dead wood. Sauvage also experimented this year.

The introduction of wrought-iron hulls for steam-vessels produced great improvements. It enabled builders to combine a strength and lightness of draught peculiarly advantageous in some branches of trade and in certain localities. The "Alburkha," of fifty-five tons, built as a companion to the "Quorra" for the Niger expedition in 1832, gave great satisfaction. Messrs. Laird, of Liverpool, their builders, immediately commenced the "Garryowen," to run between Limerick and Kilrush. The "Garryowen" was one hundred and twenty-five feet on deck, twenty-one feet six inches beam, with engines of fifty horse-power each. The "Garryowen" was driven on shore in the great hurricane which happened soon after, but escaped uninjured. This evidence of

the power of iron vessels to withstand the casualties of the sea so raised their estimation that they were rapidly increased in number and their size greatly extended. The "Garryowen" was the first steamer built that had a *regular arrangement of water-tight bulk-heads.*

1820.—THE "AARON MANBY."—The first steam-vessel ever constructed of iron was the "Aaron Manby,"[5] launched in 1820, and named for her builder. She was constructed at the Horsely Iron-Works in sections, and was sent to London and put together in dock. September, 1821, Captain—afterwards Rear-Admiral—Sir Charles Napier, a partner in the speculation, took charge of her and navigated her from London to Havre, and thence to Paris, without unloading any of her cargo. She was the first, and for *thirty years afterwards* the only, vessel that sailed direct from London to Paris. In 1843 she was in good condition, and to that time had required no repairs on her hull. She was broken up in 1855, after thirty-five years' service.

1832.—The third steamer to cross the Atlantic was the "Royal William," built at Quebec in 1831 by Mr. George Black for the Quebec and Halifax Steam Navigation Company. She is described as 360$\frac{44}{94}$ tons burden, one deck, three masts, one hundred and sixty feet long; breadth above the main wales, forty-four feet; between paddle-boxes, twenty-eight feet; schooner-rigged, carvel built. She was towed to Montreal, where she was fitted with marine engines with side levers by Messrs. Bennett and Henderson. The ship created a profound sensation, and especially upon the officers of one of his Majesty's frigates, who fired at her as she was steaming through the Gulf, and she was compelled to lay to until convinced that there was nothing diabolical in her construction. The only cargo she carried on her trip across the Atlantic was coal, which was nearly all used on the voyage. The good people of Cockaigne thronged to see the strange craft in the Thames, and were heard to remark that the "Indians" were not unlike themselves, the hallucination being strengthened by the fact that the ancient mariners were talking French. While in the Thames the "Royal William," according to our informant, was sold to the Spanish government, and became the "Isabella the Second," and the first war-vessel of the Dons.

Mr. Joseph George Dauten, who was the second engineer of the "Royal William" on this Atlantic trip, was in Montreal in 1880.

Her Majesty's ship "Rhodamanthus" arrived at Barbadoes May 17, 1832, from Plymouth. She was the first vessel of the Royal Navy to make the voyage to the West Indies, and the Portsmouth *Herald*, in announcing her intended departure, says, "we are anxious to learn what may be the effect of the climate on the engines, fittings, etc."

1832.—THE FIRST IRONCLAD BATTERY.—Robert L. Stevens

[5] Previously noted.

conceived the Stevens battery in 1832. It was to be an iron-armored ship, two hundred and fifty feet long, and twenty-eight feet beam. His brothers, J. C. and E. A. Stevens, assisted in the experiments, and the keel of the battery was laid in 1843. In 1854, the improvement in projectiles having got ahead of the growth of the battery, the old designs were abandoned and the keel of the Stevens battery, as it was called, was laid. It was designed to be forty feet over all, and forty-five feet beam, with a draught of twenty-two feet, and six thousand tons displacement. Powerful engines devised by Mr. Stevens were to give the battery a speed of fifteen and three-quarter knots. Mr. E. A. Stevens at his death left one million dollars to complete the vessel, directing that it should be given when completed to the State of New Jersey. This million, together with nearly as much expended before, was used up. The heirs claimed the battery and began a suit to have it declared theirs. The New Jersey courts held that the title was in the State, and the heirs appealed to the United States courts for the reversal of the decision. Meanwhile, the battery stood on property belonging to the Stevens' estate valued, it is claimed, at one hundred and fifty thousand dollars. The heirs desired to make the property remunerative, and in order to get the battery away asked the chancellor to have the battery sold.

In 1880, in pursuance to a decree of the Court of Chancery of New Jersey, the whole of the still unfinished Stevens battery, together with three steam-engines used in the workshops and in the construction of the hull, an immense quantity of iron, bolts, and screws, and a lot of tools, wrenches, punching- and bolting-machines, were sold at auction, at the yard in Hoboken, to William E. Laimbeer, of New York, for sixty-two thousand seven hundred and ninety dollars. It had cost nearly two million dollars.

The battery and material were divided into eight lots. The first lot, comprising the hull of the vessel so far as it was completed, with the engines and boilers on board, a locomotive boiler and Worthington pump, and a quantity of rope and trestle-work and shed beneath which the battery is housed, was offered for sale as soon as the master in chancery had read the decree and stated the conditions of sale, as follows: On each of the seven small lots ten per cent. of the purchase-money to accompany the purchase, and the remainder on October 20. On lot one, the vessel, ten per cent. of the purchase-money down, sixteen per cent. on October 20, and the rest, if the vessel, etc., should be removed in one lot or remain on the ground for completion, before the 1st day of January, 1881; or if removed piece-meal, in installments as the material is removed, at the rate of twenty dollars per ton. The bidding opened at twenty-five thousand dollars, and rose quickly by one thousand-dollar bids to thirty-two thousand dollars, then by five hundred dollars a bid to forty-seven thousand dollars, after which it

dragged at two hundred and fifty dollars a bid to fifty-five thousand dollars, at which figure it was knocked down to Mr. William E. Laimbeer, of No. 51 East Thirty-first Street, New York. The only bidders besides the purchaser after thirty-five thousand dollars had been offered were Mr. Purves, of Purves & Son, Philadelphia, and Mr. Clancy, of Boston.

In 1832 the "General Jackson" was the only steamer running in the Sound between New York and Norwich. She was thought in her time a splendid craft, and no one ever imagined that any improvements could be made in regard to her beauty, speed, or comfort. But time works wonders. "She had no state-rooms, her passengers being compelled to sleep in berths below the water-line. These were roomy enough, but at times they were not numerous enough to accommodate the throngs that took passage. On these occasions Captain Havens used to resort to a lottery. Whenever he saw that all could not get berths he'd send a boy on deck with a big bell, which he'd ring and tell the passengers to step into the cabin for berths. When all had assembled he would place slices of paper with numbers corresponding to the berths, and as many blanks, and shake 'em up. Then each man or woman would step up, draw a slip, and if there was a number on it, that berth was placed at the disposal of the lucky one. If not, it was a matter of solicitude to find a soft place on the cabin floor. It was a rare thing, however, for a lady to be compelled to rest that way, as the more fortunate males gallantly surrendered their privileges and slept where they could find a place."

1833.—The First Mail Contract.—The first contract for carrying the mails in steamers was made by the British postmaster-general in 1833, with the "Mona Isle Steam Company," to run semi-weekly between Liverpool and the Isle of Man at eight hundred and fifty pounds per annum. After this a contract was made in 1834 with the "General Steam Navigation Company," for the weekly conveyance of the mails between London and Rotterdam and London and Hamburg at seventeen thousand pounds per year. Both these contracts continued in force twenty years or more.

1833.—Early Steamboats on the Lakes.—Mr. Randall, of Philadelphia, in 1833, built the "Wisconsin," two hundred and eighteen feet long by thirty-eight feet wide, at Detroit, and ran her through three of the lakes on round trips of two thousand miles. In 1845 he designed and navigated the "Empire," two hundred and fifty-one feet long, thirty-eight feet beam, sixteen statute miles per hour. Soon after the "City of Buffalo" and the "Western Metropolis" were sent afloat. They were sister boats three hundred and forty feet long, forty-two feet beam, and only nine and one-half feet draught of water, light laden. By a report in the Cleveland *Herald* the trip between Buffalo and Cleveland at that early date was made at an average speed of twenty-

one miles an hour by the "Metropolis," the "City of Buffalo" making even greater speed.[6]

1833.—H. M. steam-packet "Firebrand" traversed, in sixty-six days, eleven thousand five hundred miles in two voyages from Falmouth to Corfu, and one from the same port to Lisbon. In the same year the "Royal William," of one thousand tons burden and one hundred and eighty horse-power engine, built on Three Rivers, in Lower Canada, made the voyage from Pictou, Nova Scotia, to Cowes, in the Isle of Wight, being the *third* transatlantic voyage[7] of a steamer. She was employed for three or four years between England and Ireland. She afterwards made several voyages across the Atlantic. The people of the provinces claimed for her the credit of the first ocean transit by steam. The Historical Society of Chicago has the original working plans of this vessel, presented by James Gouchie, a Scotch ship-builder, who, in 1880, was a resident of that city. She was launched at Quebec in 1831, and made the trip from Pictou to London in twenty-five days. In 1837 "The City of Dublin Steam Packet Company" purchased the "Royal William," and she made her first voyage from Dublin to Liverpool, October 9, 1837, in nine hours and forty-eight minutes. Soon after she was sold to the Spanish government for ten thousand pounds, and converted into a man-of-war. She sailed from Pictou to cross the Atlantic April 1, 1833.

[6] In 1860, Mr. Randall designed and modeled a vessel for an ocean steamship line to be called the "Philadelphia and Crescent Steam Navigation Company," organized for constructing vessels for trading between Great Britain and Philadelphia, which obtained an act of incorporation from the State Legislature of Pennsylvania. This vessel was to be five hundred feet long, fifty-eight feet moulded beam, and to measure eight thousand tons. Her motive-power was to consist of two sets of wheels. She was to have ample accommodations for three thousand passengers and three thousand tons of cargo, and to be a regular "twenty-mile ship." She was to have ample fuel room sufficient to run eight thousand miles without stopping for coal; a main saloon of three hundred and fifty feet of uninterrupted length and one hundred and seventy-five family state-rooms, with double beds in each of extra size, etc. A dining-room and drawing-room, each one hundred and fifty feet long, a social hall, reading-room, smoking-room, and library, etc.—*Lindsay's Merchant Shipping*, vol. iv., pp. 157, 158.

Unfortunately, this magnificent design of Mr. Randall was never put to a practical test at that time, but he only anticipated the large ocean steamships of to-day.

[7] The "Savannah," 1819, from Liverpool, was the first; the "Curaçoa," from Antwerp to Curaçoa, the second.

GEORGE H. PREBLE,
Rear-Admiral U.S.N.

(To be continued.)

NOTES ON CAVALRY.

THAT cavalry has always played a more or less important part in warfare from the earliest ages down to the present day there can be no doubt; but the part played by it at different times has varied much, it sometimes being relied upon as the main arm of the service, and at others being but an auxiliary force.

It has been said that the Egyptians used cavalry, but to what extent is uncertain, and there can be but little doubt that the war chariot long precedes the armed horseman. Numerous war chariots are shown on Egyptian monuments, but, with one exception, not a single horseman. However, Sesostris is reported by Diodorus Siculus to have had a force of twenty-four thousand cavalry in his army.

A corps of cavalry composed of young women is spoken of by both Hippocrates and Plato as existing about 500 B.C., but the existence of this Amazon corps is doubtful.

Lycurgus about 743 B.C. is the first person we hear of as really having organized cavalry, and in an authentic account by Xenophon he is spoken of as forming his troopers in divisions. The accounts of the use of cavalry become more definite as time goes on.

Epaminondas raised a cavalry corps five thousand strong about 371 B.C. The battle of Granicus, 334 B.C., probably offers the first instance of an engagement where cavalry played a decisive part.

The cavalry of the Persians was placed at charging distance from the fords of the river, and as soon as the Macedonian infantry emerged from the banks, and before they could deploy, the Persian horsemen were upon them and drove them headlong into the river.

At the battle of Arbela, 331 B.C., the seven thousand horsemen of Alexander aided him well in gaining the victory. Alexander the Great is the first man mentioned as having trained part of his cavalry to fight on foot as well as mounted, and so he is the first man who ever had an organized force of dragoons.

After the death of Alexander cavalry fell into disuse until the time of Hannibal, when the Romans began to recognize its value. From this time forward to the latter days of the republic cavalry was more and more appreciated by them.

The Roman cavalry was composed largely of Gauls, who, being

bold and daring riders, made an excellent mounted armed force. Saddles were not used until the time of Constantine, and stirrups not until the middle of the fifth century, when they were introduced by the Franks.

In the Middle Ages and with the rise of the feudal system the value of the horseman also rose. The mounted armored knights were looked up to and respected more than any class of men at that period except the priests and clergy, the knights being the only persons who really constituted the fighting force.

The battle of Poitiers, 732 A.D., is the first battle where armored knights are mentioned as constituting the cavalry; here both horse and rider wore defensive armor.

In the first and greatest Crusade the cavalry is spoken of as constituting the real nerve of the army, and amounting to over one hundred thousand mailed horsemen. It was during this crusade that the battle of Dorylæum took place, one of the most tremendous cavalry battles that has ever been waged. The Sultan of Roum with three hundred thousand horse attacked the knights of the Crusaders, and after a desperate fight the Crusaders won only by a direct charge.

The introduction of gunpowder into warfare caused great changes in the organization and manœuvres of cavalry; and cavalry as it now exists may be said to date from the time when Charles the Second of France organized a standing army in 1445. Different species sprung up in different countries. In Hungary the hussars, carabineers in Basque and Germany, and Louis of Nassau in 1543 made use of a hybrid force, consisting of carabineers with infantry mounted behind them. Lancers were much and first used by the Spaniards and Germans. Cuirassiers belong more particularly to the French.

Some European nations still retain a force of lancers and some a force of cuirassiers, but the tendency is to convert all cavalry into dragoons.

The lance, a weapon requiring much practice for its skillful use, is at a great disadvantage in a wood; these facts largely influence its being laid aside.

The cuirass worn by the cuirassiers, although not penetrable by an ordinary revolver bullet, affords no protection from the bullet of the small-calibre high-velocity rifle, and on this account will doubtless soon be discarded, as the high-velocity rifle is likely to be adopted as the fire-arm for the armies of all nations. The fact that cavalry can no longer successfully charge infantry when the latter are prepared to receive them, although the infantry be but a strong skirmish line, does away with cavalry on the field of battle to a large extent.

They, of course, can be used to draw the fire of the infantry from other troops upon themselves to their own almost entire destruction, as

was the case at Woerth and in Van Bredow's charge at Rezonville; also at Sedan, where the German infantry, deployed as skirmishers, almost completely annihilated the French cavalry.

But seldom would cases arise where it would be advisable to sacrifice such an expensive arm of the service, it being estimated that a trooper costs the government three times as much as a foot-soldier, merely to draw fire from other parts of the field.

The successful use of cavalry on an open field is no longer possible. The extreme range, accuracy, and rapidity of fire of modern small-arms and cannon have placed infantry and artillery on more than an equal footing with mounted troops on an open field of battle.

Cavalry now advancing to an attack is subject to an accurate and destructive fire from artillery at a range of three thousand five hundred yards or more, to machine-gun fire at two thousand yards, and this at distances less than seven hundred yards becomes most deadly.

Cavalry, however, will be used against cavalry; it will be used to form the advance- and rear-guard of an army; it will be used for scouting, reconnoitring, foraging, raiding, and obtaining information; it will be used to veil an army, to act as vedettes, to harass, to pursue an enemy in retreat or disorder, to follow up an enemy after a lost battle, —more or less completely destroying him, already dispirited and disheartened by defeat.

The length of the charging line will never be as great as formerly. Charges have been made with a front of thirteen hundred to fifteen hundred yards, but these will never occur again, and the front of a line in charging will rarely exceed one or two squadrons. Cavalry may be used on the field of battle against infantry when it can take them by surprise, and it is then most effectual.

It is reported by an eye-witness at the battle of Königgratz that, a battalion of infantry being broken up by shells, a squadron of dragoons, evidently taking advantage of their disorder, attacked it and captured three officers and seventy men.

In the same battle a squadron of hussars not exceeding one hundred men attacked a battalion of infantry and took it prisoner. Sixteen officers, six hundred and sixty-five men laid down their arms to less than one-sixth their number. The battalion was surprised and captured before it could offer resistance. In this way cavalry may render the greatest aid in battle; and if possible to hold it near the field so that it may rush in when opportunity offers, it may turn the tide of an engagement, as has often happened.

Cavalry also has its dismounted use on the field of battle. In this way, again, it may prove of great assistance by being able to reach quickly one part of the field or another, then being dismounted and thrown forward.

Different nations dismount different proportions of their entire

mounted force, some as few as only two-thirds of the entire number; but this small proportion dismounted, unless the support and reserves are taken from it, leaves but a weak force for the fighting line.

The idea of thus dismounting so small a number is that, in case of a repulse to the dismounted force, those who remain mounted may cover their retreat and enable them to mount.

The best way, however, of using mounted troopers to fight on foot is generally thought to be to dismount the greatest number possible, leaving only a sufficient number mounted to manage the horses.

It has been said that cavalry will be gradually done away with on account of their ineffectiveness against infantry on an open field. The fallacy of this is evident upon a consideration of the various duties which are now demanded of mounted troops, and which can be done by them alone.

Although infantry may be the most important arm on the field of battle itself, it will be the cavalry that will be used to veil their movements until the actual battle takes place. It will be the cavalry that, acting as advance- and rear-guards, will enable the infantry to march at ease and sleep in peace. The cavalry will guard their ammunition and provisions while being transported to them, will obtain the information necessary to make the battle a success, and will, by taking advantage of an opportune moment in the struggle, rush in and turn what might have been defeat into victory.

S. B. Arnold,
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AMONG OUR CONTEMPORARIES.

ONE of the daily papers lately remarked in an editorial, "Efforts have been made in every Congress for several years back to have the United States Fish Commission made a bureau of the Department of Agriculture, and the bill for this purpose is before the present House. There is no good reason why the Fish Commission should be made subordinate to any department, as its work, properly managed, is clearly distinct. But if from any reason of centralization of authority it is deemed necessary or expedient to place it under one of the great departments, why that of Agriculture? There is no possible connection between the two. It would be just as ridiculous to render the Fish Commission subordinate to the Interior Department. Should a change in the present status be thought wise, the Naval Department would be the more natural place for it to be located, since the most important work of the United States Fish Commission is the improvement of the ocean, great river, and lake fisheries. But the movement is not for the betterment of fish culture; it is in the interest of a few petty politicians, who think they see more in it as a bureau of the Department of Agriculture than as a part of the navy or as an independent body.

"The proposition to make the Coast and Geodetic Survey and the Bureau of Statistics subordinate to the Agricultural Department are equally objectionable."

In our opinion it is seldom that so much common sense is found in so few lines as the foregoing. The Fish Commission has done and is doing excellent work. It would be a pity to squelch it.

A contemporary, speaking of the German navy, says, "The seafaring contingent of Germany numbers about fifty-five thousand men, all obligated to service in time of war. With all the war-ships fitted with full complements, there would be still an estimated reserve of five thousand men. The force of sailors is organized in two large divisions, and these are subdivided. The harbors and forts along the coast are manned by sailors.

"Naval apprentices are received for instruction after the age of

seventeen. The physical examination is strict, but, as a rule, German boys are hardy, and the majority of applicants easily pass. The course consists of six months on board a receiving-ship at Kiel, and afterwards in other vessels. This preliminary service is continued the next year in a long voyage across the ocean. Another ship receives them the third year for the study of artillery.

"Wages are very low throughout the German navy. A seamen is paid four dollars and a half a month; petty officers receive from nine dollars to twelve dollars a month, and the highest warrant officer gets only four hundred and fifty dollars a year; but commissioned officers have fairly liberal allowances besides their small salaries.

"A boy must be seventeen years old at least before he can enter as a cadet. He is required to pass a very strict examination in mathematics, physics, drawing, French and English,—modern languages being considered of the highest importance to a naval officer. A training-ship receives the pupil for a cruise of six months in the North Sea; then he spends six months in a marine school at Kiel, and six months more on board a cruising vessel, taking a voyage in which theory is supplemented by practice. Then, if he passes another strict examination, he becomes an under officer."

The two French officers who are imprisoned in the fortress at Glatz for espionage live, writes the Berlin correspondent of the London *News*, in two separate rooms, the windows of which look into the fortress yard. They are simply but neatly furnished with a table, chairs, wardrobe, and bed. The floor is stained. The rules, which have to be strictly obeyed, are hung up in each room. The officers are allowed to read only novels.

They are waited on by a soldier of the garrison, who cleans the rooms, makes the beds, brushes and cleans their clothes and boots, and fetches their meals, which the wife of a sergeant living in the fortress prepares. By order of the commander, their meals must be good and ample. According to the *Breslauer Zeitung*, their breakfast and afternoon meal consists of coffee, cream, and white bread; their dinner of soup, roast meat (sometimes two courses), fish with wine sauce, and preserves. Their daily board is fixed at one shilling and sixpence, half of which the prisoners have to pay out of their own pockets. Their two hours of recreation, morning and afternoon, in the yard are punctually kept, and they are then under the surveillance of a guard. During these walks they arrange the bill of fare with the sergeant's wife.

Almost daily, General Buchholz inquires whether the two officers wish for anything, and whether they are satisfied with the cooking, etc. They answer that they have no complaints, and are quite satisfied with

their treatment. Since the French officers have arrived at the fortress few strangers are admitted, and the guard has been strengthened by three men, who are specially to watch them, and prevent any intercourse, so that they are completely cut off from the outside world. The soldier who waits on them is to be relieved every month.

These officers were caught so fairly in their work about Kiel Bay, —masquerading as English yachtsmen, in a chartered English yacht, —that even a Frenchman could interpose no valid reason why they should not suffer for their attempt.

There is one thing to be wondered at, and that is that any Frenchman should suppose he would pass as an Englishman on one of their eccentric voyages.

After all, it is a time of peace, and the Germans appear to have acted in a very moderate way—if reports are to be taken—in the treatment of their prisoners. Perhaps the French would not, in the case of Germans, have pursued so temperate a course.

The English *United Service* lately contained a notice of an ingenious arrangement for ascertaining distance by sound, the invention of Captain Thouvenin, of the French Artillery. The arrangement, which is known as the Thouvenin Phonotelemetre Watch, consists of a keyless watch fitted with a compass and a double graduated scale round the dial of the watch, which permits of readily measuring angles and distances, it being possible to appreciate the length of time taken by the sound in reaching the recorder to the fortieth part of a second. The watch has already been recommended by the French and Russian War Ministers, and a number have been ordered by the Minister of Public Instruction for teaching topography in the government schools.

The *Army and Navy Gazette* says, "The *Allgemeine Militär Zeitung*, of Darmstadt, publishes an incident in the life of the French general Prince de Beauffremont which most people will consider very much to his credit as a wise and honorable man. The recent death of the prince removed the obstacle which for twenty-three years had prevented the publication of the facts. During the Franco-German War of 1870–71 the prince, who then held the rank of colonel, was made a prisoner of war, and, with many other French officers, chose Bonn as a place of residence, all having given their word of honor that they would not escape. At that time, as is well remembered, there were also large camps of prisoners of war in the neighborhood of Cologne. One day the prince confided to a respectable sergeant in Bonn that for some time persons had been not only inciting the French soldiers to rise, but trying to persuade the officers to break their parole and head

the men. It was intended to unite with the prisoners in camp at Coblentz, the rising was to take place simultaneously, the guards were to be overpowered, and an army was to be formed. All was arranged for Christmas Eve. Prince de Beauffremont said that, having given his word that he would take part in no hostile enterprises against Germany, he felt it to be his duty to make this communication. Measures were promptly taken, and the plan was frustrated. By this means the French officers were spared further temptation to dishonor, and a frightful massacre of the prisoners was averted.

There have lately been published in England two books which are especially interesting to soldiers, and which would be valuable additions to a post library. The first is the "Reminiscences of the Great Mutiny, including the Relief, Siege, and Capture of Lucknow, and the Campaigns in Rohilcund and Oude, by Forbes Mitchell, Seventy-third Southerland Highlanders."

This was Sir Colin Campbell's own regiment, and, with all his regard for it, his confidence in the stuff of which it was composed led him to "put it in" whenever hard knocks were to be encountered.

Forbes Mitchell was a sergeant in the Seventy-third; apparently a man of some education, and certainly of considerable ability, so that this view from the ranks is a novel as well as an interesting one,—giving details of those exciting days which were most likely entirely unknown to the ordinary historian or correspondent.

The other book is entitled "A King's Hussar: being the Military Memoirs for Twenty-five Years of a Troop Sergeant-Major of the Fourteenth Hussars." In it is shown the internal life and working of the regiment in which the writer served so long,—the corps having originally been the Fourteenth Light Dragoons, the achievements of which, during the Peninsular War, have been immortalized by Lever in his "Charles O'Malley."

It appears that the nickname of the regiment is the "Young Jocks," and, like other English regiments, it has its own peculiar customs and observances. One of them is shown in the following description of the funeral of a private who was the first to die after the regiment reached India:

"My troop was ordered to parade in full dress, without arms, excepting twelve of the men who carried carbines, and were called the firing party. A black horse, to represent the dead man's trooper, was robed in a costly black velvet pall embroidered with a white skull and crossbones (this was peculiar to our regiment), with a plume of black ostrich feathers on the bridle. Across the saddle, supported by the collar-chains, dangled the dead soldier's spurred boots, toes reversed. The horse was led by two men, cloaked in black, one on each side hold-

ing it by a new pocket-handkerchief passed through the rings of the bit. These handkerchiefs, when the ceremony was over, were always kept by the men as a memento. . . . Contrary to the usual marching order, the shortest and youngest privates led, the older and taller men following; the non-commissioned officers came next, and the captain brought up the rear. Another curious thing was that the men stepped off with their right instead of by their left foot, as is customary. When we passed the guard-room the sentry turned the guard out, and for once and once only in his career the poor dead private received a 'present arms.'"

We had no thought of returning to the camel question when the last letters in regard to their existence in a feral state in our own Southwestern country were printed. But since that time we have met with a book—published in London, 1893—entitled "Wild Spain: Records of Sport, Natural History, and Exploration. By Abel Chapman, F.Z.S., and Walter J. Buck, C.M.Z.S., of Jerez."

These members of the Zoological Society of London declare that they have seen wild camels in the *Coto de Doñana*, in the *Marismas de Lebrija*, a swampy, deserted region to the northwest of the Guadalquiver, in Andalusia. The statements were denied by persons supposed to know the region, but the testimony is so strong that it shakes the belief in the impossibility of such a thing as feral camels.

Mr. Chapman writes, "No doubt it is a startling statement that wild camels are roaming at large in Europe, or anywhere else,—it would hardly seem more incredible if a herd of hippopotami were reported in the Upper Thames. The camel has never within historic times been known to exist in a wild state; it has always been the servant of man,—a beast of burden and domesticity. More than this, a certain physical disability or cause has been alleged to exist, which, if correct, would render their permanent continuance in a natural state an impossibility. Nor could any region be well conceived so ill adapted—indeed repulsive—to the known habits and requirements of an animal always associated with arid sandy deserts as the Spanish marismas, which, always marshy, are subject to actual inundation during six months out of the twelve."

Mr. Buck writes, "The camels were brought here first from the Canary Islands by Domingo Castellanos, *Administrador* to the Marques de Villa Franca, in 1829, he intending to make use of them in the Coto for transporting timber, charcoal, etc. The descendants of this Domingo now own the fifty or sixty animals which make the marisma lying between the Coto proper and the Guadalquiver their feeding-ground. They seldom appear on the wooded parts, remaining winter and summer in the marisma, moving with the greatest ease in winter

through the mud and water from one island to another, occasionally coming to the woods to pasture on the tops of the young pines."

In a "Catalogue of the Mammalia of Andalusia," by Don Antonio Marchado y Nuñez, published at Seville in 1869, is found, "The first camels, which were introduced with the object of breeding them, came from the Canary Islands, and in a few years became a herd of about eighty. In 1833, a few years after introduction, they were used as beasts of burden and transport in the province of Cadiz. . . . But some untoward accidents on the roads through horses being frightened at the sight of such strange animals, and the necessity of separating them from horses in the yards, combined with other matters not easy to remedy, caused them to fall into disuse as beasts of burden and carriage, and thus the economy and advantages obtained from their introduction were lost. They were then used for agricultural purposes, and some lands which Don Raphael de Barrera holds are at this time (1869) cultivated by the aid of camels, which are used for ploughing and other agricultural work." The Barreras afterwards failed, and the camels, being ownerless, are said to have run wild.

In a note to the chapter the English observers say, "The repugnance evinced by horses towards the camel was known ages ago. At the battle of Sardis (B.C. 546) this equine weakness was utilized by Cyrus in opposing to the Lydian cavalry a vanguard of camels (Herodotus, Clio, pp. 78, 80). A similar stratagem was proposed by Amurath I. at the decisive battle of Kossovo between the Ottoman army and the confederate hosts of Servia, Bosnia, and Wallachia, August 27, 1389, but was abandoned in deference to the fiery impetuosity of Prince Bajazet and some supposed precepts of the Koran."

It will be observed that the Spanish testimony in regard to camels frightening horses unaccustomed to them is the same borne by Colonel Biddle, of the Ninth United States Cavalry, and others, given in former numbers of these notes.

The testimony given in the book upon Spain is remarkably circumstantial, and we must believe that camels without masters and owners have existed in Andalusia for a number of years; but the most remarkable part of the matter is that these spongy-footed beasts should continue to exist in a region which is, for most of the year, a marsh interspersed with sheets of shallow water of miles in extent.

It is not disputed—indeed, the fact is deplored by those most interested in the education of our Indian youth—that the young men and women who have graduated with honor from Eastern institutions are apt to relapse into their original condition when returned to their own people. Indeed, it is said that music, philosophy, and the use of globes have no restraining influence, in most cases, when the young Indian has been a

few months back upon his reservation. It is certain that some of them become more barbarous than they were before coming to the Eastern schools, and some of the most restless and turbulent of the Cheyennes, for example, had received excellent training in the East.

One potent reason for this state of things was recently given by an experienced army officer to a correspondent of a daily paper. "It is not strange," he says, "that Indians of both sexes, trained in these Eastern schools, relapse into their original condition when returned to the reservations and their ignorant and barbarous relatives and friends. . . . They had been taught the trade of carpenter, blacksmith, wheelwright, or painter, and then returned to their tribes only to find that all demand for their trades had been supplied by white men sent out and employed by the Department of the Interior. With no opportunities for employment in the trades taught them, it is not unnatural that they should fall into the habits of their kindred and associates and forget the lessons taught in the Eastern schools. Most of the young men from the schools, no other employment being offered them, become scouts,—and not always with advantage to the military service. . . . It seems like folly to train young Indians for agricultural and mechanical pursuits, and then turn them adrift in a country among a barbarous and nomadic people, surrounding them with influences hostile to methods of civilization, and with no opportunity to apply the knowledge gained during their two or three years' training in the East. If these young Indians, upon leaving the schools, were detailed by the Interior Department to take the places of white men whose duties they are competent to perform, thus furnishing them with profitable occupation, they would not only be confirmed in the ways of civilization, but the force of the example would prove an incentive to others of their race to take on civilized methods, and the graduates of the schools would become teachers by precept and example of their people."

The officer did not refer to the Indian girls who received their education in the East, many of them very bright in mind and taking readily to all female accomplishments, who must return to their reservations and experience the amenities of the paternal *ménage*,—some to sink to the condition of the ordinary blanket squaw. Their fate must be worse than that of the young men, in many cases.

In view of the noble work done by our Life-Saving Service one would suppose that it would be continued the year round, instead of being intermitted for the summer months, when marine disasters, if not so frequent as in the winter, nevertheless occur,—with loss of life and property in comparison with which the cost of the service is a mere bagatelle. It is with pleasure, therefore, that we reproduce an editorial from a daily paper which is short and to the point. The Philadelphia *Telegraph*,

the paper alluded to, says, "There used to be a system in towns and cities in this country of lighting the streets only on nights on which the almanac announced there would be no moonlight. Cloudy nights might follow one another during the whole period of the moon's radiance,—it was a matter of comparative indifference to the officials,—the lamps were not lighted. Theoretically, the moon was shining brightly, even though rain was falling in torrents or an inky darkness shrouded everything. In like manner, theoretically, from the month of May to September there are no storms on the Atlantic Ocean. Acting on this assumption, the United States, when it established life-saving stations on its coasts, decided to close them during these four months of the year. City officials have found that the moon is not always visible when the almanac pronounces it radiant, and have the street-lamps lighted nightly; but the United States apparently have not yet recognized the fact that there are frequent and severe storms during the summer months, through which vessels are wrecked, human lives sacrificed, and treasure lost, for with the regular coming of May day the life-saving stations are closed, and between that time and September 1 what life and treasure are saved from the wrath of the sea must be saved by volunteers. Efforts have been made every year to induce Congress to take a sensible view of the matter and have permanent life-saving stations, but thus far without avail."

Mr. Edgar S. Maclay, in his "History of the Navy" (the first volume of which has lately been published), alludes to the necessity for a navy in the following words (he is speaking of the year 1798 and of the depredations of the French cruisers and privateers upon our fast-growing commercial marine):

"Washington saw the necessity and economy of a permanent naval establishment, and he repeatedly urged the subject upon Congress. In a speech before both Houses, December 7, 1796, he said, 'To an active, external commerce the protection of a naval force is indispensable.' Not only did Washington promulgate this doctrine, but he maintained that 'to secure respect to a neutral flag requires a naval force organized and ready to vindicate it from insult or aggression.' He furthermore advocated the 'gradual creation' of a navy, and said, 'Will it not be advisable to begin without delay to provide and lay up the materials for the building and equipping of ships of war, and to proceed in the work by degrees in proportion as our resources shall render it practicable without inconvenience, so that a future war with Europe may not find our commerce in the same unprotected state in which it was found by the present?'"

Mr. Maclay goes on as follows: "The population of the United States at this time numbered nearly five millions, while the exports

from October 1, 1797, to September 30, 1798, were valued at $61,527,097, and the imports at $63,000,000. The total tonnage of the merchant marine was nearly nine hundred thousand tons, valued at $29,397,963. The entire cost of the navy from 1794 to 1798, including building, arming, equipping, and keeping the ships in commission, was $2,510,730; and at a moderate calculation the gain to American merchants in the lowering of insurance, caused by the existence of this naval force, for the year 1798 alone, was $8,655,556; so that the economists in Congress, who had been so loudly boasting that they had saved the United States Treasury two or three million dollars by not establishing a navy, had, in fact, been extorting from the people many times that amount in the form of high insurance, which the absence of a naval force had made necessary, besides paying several millions in tribute to the piratical states of Barbary. View it in whatever light we may, the expense of maintaining a respectable and progressive navy is nothing more than a safe, economical, and necessary insurance on the prosperity of the nation."

Ever since the period when the Roman mothers exhorted their sons to come home from war either victors or borne upon their shields, women have had much to do with forcing men to take up arms during critical times. It was so in our own country during the Revolution, and more distinctly so during the Civil War, especially at the South. The fact is illustrated by a passage in a remarkably interesting little book lately published in Paris, entitled "Une Famille Noble sous la Terreur," in which Mademoiselle des Echerolles gives us a most realistic account of the French Revolution, as far as events occurred under her own eye. Her family suffered, in property and in person, the usual fate of the *aristos* of that day, and she herself went through unheard-of trials and escapes. Speaking of her own Department—the Bourbonnais—at the time of the first rush of Republican volunteers to the Rhine, she says, "The women, always extreme in opinion, permitted no shilly-shally in the matter. Night-caps, dolls, and distaffs were sent to young men who could not make up their minds to join the army, while anonymous ironical letters accompanied the gifts." These had a wonderful effect upon the clodhoppers, who found themselves under arms without knowing exactly how it all came about.

Among the stupid things at the Chicago Exhibition,—and stupid things, such as great cheeses and fruit and butter exhibits, were not few,—about the most senseless thing was a huge bell, called the "Columbian Bell," cast under the auspices of certain good ladies who called themselves "Daughters of the Revolution." For two or three years before the Exhibition they industriously gathered pieces of sword-hilts,

buttons from military uniforms, bullets from battle-fields, pieces of old musket-barrels, copper coins and tokens, and, in fact, everything of a metallic nature which was supposed to have a war remembrance of any kind.

In this way a number of people, led away by false enthusiasm, no doubt disposed of relics which may have had a certain value, but which are now merged in one confused mass which is without any reason for existence. The object appears to have been to make a bell larger than the famous Liberty Bell to be exhibited at Chicago, and then to make a triumphant circuit and to be rung in every large town in the land. These enthusiastic, misguided ladies had even the vision of going abroad with their bell,—why, no one but themselves could tell.

To their disappointment and disgust the whole thing fell flat, and the "Committee's" extensive tour had to be abandoned, for few people took enough interest in it to take the trouble to see it. It would be a curious thing to know what has become of the "Columbian Bell." Is it still in Chicago?

The following curious passage is quoted by a writer in the Philadelphia *Ledger* in response to an inquirer: "It is believed that the first mention of the use of oil to quiet the waves is found in Bede's 'Ecclesiastical History,' written from 716 to 731 A.D. In Stapleton's translation, made in 1565, occurs the following: 'How worthy a man this Bishop Aldan was God, the high and only judge of men's hearts, by sundry miracles declared to all the world. A certain priest called Utta, a man of great gravity and truth, at what time he was sent into Kent to fetch Eanfleda, King Edwine's daughter, appointing so his journey that he minded to travel thither by land, but to return with the young lady by water, he went to Bishop Aldan, beseeching him to make his humble prayers to God to prosper him and his, who were then taking their journey. The bishop, blessing them and committing them to the goodness of God, gave them also hallowed oil, saying, "I know that when you shall have shipping, a tempest and a contrary wind shall rise upon you suddenly. But remember that you cast into the sea this oil that I give you, and anon, the wind being laid, comfortable fair weather shall come on the sea which shall send you home again with as pleasant a passage as you have wished." All these things were fulfilled in order as the bishop prophesied.'"

Referring to some remarks in these notes for May last in regard to public holidays, a gentleman writes us from New York with a suggestion which has great merit, and that is the making of October 17, the anniversary of the surrender of Burgoyne, a public holiday in that

State. "Possibly, if so enacted," he says, "it might extend eventually to other States." He further states that the bill would have been presented at the last session of the New York Legislature but for the illness or unavoidable absence of certain members who had an interest in the matter, and that next year he hopes to see it promptly introduced and passed.

The correspondent's reason for making "Saratoga Day" a legal holiday is thus stated: "The importance of the event was such that only the surrender of Vicksburg parallels it." The surrender of Saratoga prevented the infant colonies from being cut in two by British control of the Hudson, while that at Vicksburg cut off a great territory from which men and stores were supplied to the Confederacy and secured the control of the Mississippi for the Union.

The correspondent is sound enough on one point, and we can only hope that he may be successful in adding another holiday to those we now have in this high-pressure age. It would seem that this is a proper subject for the action of that influential society, the Sons of the Revolution, which has already done so much in commemoration of the events of that period in our history. A memorial from that body, presented and advocated by a proper committee, could not fail to have a favorable influence upon the Legislature.

Even to one who is not an expert in such matters, the building of ships of war, which may be indefinitely detained in waters favorable to marine growths, animal and vegetable, without the provision of sheathing and coppering seems unwise and unbusiness-like. It may be a little more expensive at first, but its neglect is very short-sighted. Take vessels which have been obliged to remain long in observation in tropical waters, and then suppose a sudden movement, an emergency where speed is required, how is it to be had when the bottoms are covered with algæ, barnacles, and other growths six inches thick, and looking like the surface of a half-tide rock? The deterioration of the plating of the bottoms of unprotected ships is also a matter for very serious consideration. If we had docks and coaling stations at our command in every part of the world things might be better; but, as it is, the expense and waste of time from docking and the over-burning of coal to get even decent speed from foul bottoms are things which cannot go on indefinitely without some measures being taken as to a remedy. It is very well to extol our new steel ships and their performances, under special circumstances, just as they come clean from fresh water, but there is a very different story to be told of them after lying weeks or months in harbors favorable to marine growths,—and, unfortunately, all salt-water harbors are so, some more, some less.

The boys have "top-time" and "marble-time" and "kite-time" as the months roll round. So, in due season, we shall again have the craze of "foot-ball," which has not yet exhausted itself.

If "institutions of learning," so called, choose to encourage their pupils, who are supposed to be cultivating their minds, to play in public, for money, a rough game, where the spectators, in part, are of the worst part of the city slums and the betting ring, it is their own business. No doubt it is the best and cheapest advertising such "institutions" can have with a large portion of the community.

Of these *certamina*, which are exceeded in roughness only by boxing-matches or the contests in the amphitheatre of ancient Rome, an influential contemporary last autumn wrote, "Is it possible, again, that the faculties, say of Yale and Princeton, look with equanimity on the enormous sums of money now received as gate-money every year in athletics by these young men *in statu pupillari*, and on the very large sums which change hands by betting in what may be called the collegiate world, beginning with the children who are preparing for college in the schools?" Offers of free education are made to promising players, and inducements of the kind to change from one college to another "have become unhappily common, and have ceased to become discreditable."

Happily, the games between the Naval and Military Academies, which seem to have assumed an annual character, are relieved of many of the objectionable points, such as gate-money and, to a very considerable extent, of objectionable attendance, while they are said to play in as gentlemanlike manner as such a rough-and-tumble permits. Then, there are no professionals or quasi-professionals, for all are real students, studying for a purpose, and *all paid for studying*. Here is the point. Young men must have recreation, and exciting recreation too, and it is well to give them all that the iron-clad rules of their institutions will allow; but have they any right to run the risk of incapacitating themselves physically in a game which has certainly a very remote professional bearing? Suppose a young man, a credit to the service, comes up for his graduation for a diploma with a "bad knee" or some other foot-ball injury likely to last him his lifetime? Would it be right to saddle him upon the service, no matter what his professional acquirements were? There are plenty of contests in which rival teams from the two Academies might engage. Any one qualified to shine in an assault at arms takes as much out of himself, if he has a worthy opponent, as any foot-ball player does. A competitive drill of field artillery is no very easy matter and quite in line of duty. Any injury received in such contests would have good cause of condonation by the supreme authority, but how is it to pass over a disability incurred in the foot-ball field?

We are well aware that what are called "trained men" know better how to take care of themselves on the field than others do, just as an

actor on the stage can fall flat and simulate death by long practice; but, apart from any training, there must be something inherently dangerous in the game when that entirely reliable journal, the London *Lancet*, reported, as occurring in England during 1892, twenty-three deaths directly traceable to foot-ball, and one hundred and nine grave injuries, some of which maimed or disfigured the sufferers for life.

The report of the inspector-general of the United States army for 1893 contains, among many other things, a suggestion for a regimental cavalry post. He says, "In view of the tendency to move some of the army eastward now, it is suggested that it would probably be highly beneficial to establish a regimental cavalry post at some point in the Ohio Valley, east of the Mississippi River. Everything considered, the very best point possible for such a post would seem to be at or near Lexington, in the Blue Grass region of Kentucky, which is the centre of the road-horse interest in America, and consequently peculiarly adapted to the purposes of a cavalry post. While purely thoroughbred horses might be too high-priced for ordinary cavalry purposes, still there are around Lexington grades of horses having strong strains of thoroughbred blood, which give them graceful action, fleetness, and strong powers of endurance, and make them perhaps the best types of cavalry horses in the world. The English and French governments have discovered this fact, and have sent agents to Lexington for the purpose of buying horses for their cavalry forces. The grades of horses mentioned can be bought at reasonable prices. Added to this, Lexington is situated in the midst of one of the most fertile and abundant regions on the globe, and subsistence stores of the best quality for both man and beast could be had, delivered at the post at very reasonable prices. It is believed that the people of that city would patriotically give a sufficient quantity of adjacent land of proverbial excellence for the purposes of a regimental cavalry post, and that, too, near abundant supplies of running water, with adequate and proper conditions for target-firing."

The inspector-general also remarks, "Our navy has adopted .236 as the proper calibre for small-arms,—said to be the smallest in use by any country in the world,—while our army rifle, the Krag-Jorgenson, is calibre .30; and this may prevent the interchangeability of ammunition between the two services. The chief of ordnance announced some years ago that calibre .45 would probably not be diminished while the powder then issued continued in use. The adoption of greatly reduced calibres by the armies of the world was absolutely enforced by improved mechanical devices and applied science; but a difference of twenty per cent. between the two services as to the theo-

retically perfect calibre seems excessive, and might be reconciled prior to the issue of a single weapon.

"It would not be uninteresting to note through what nationalities and during what years the calibres decreased from .69 to .58, or .57 to .45, till at last .236 is reached.

"When armies are numbered by the million the importance of weight saved and efficiency added to each cartridge becomes greatly magnified. A new propellent was applied, and the effort to determine the ultimate minimum bore has been persistent and fruitful, and the incidental effects are almost as noticeable as those directly aimed at. Hebler and like experimenters are still announcing their startling conclusions, and the calibre and propellent having been modified, now the talk is of a leadless bullet, a hollow cylinder, ogival at both ends, and with an initial velocity of over three thousand feet a second. And the effect of these hardened projectiles with their high velocities, whether at short, medium, or extreme range, as compared with the old .45, is most noticeable.

"Whenever opportunity offered I have favored a small calibre bullet and a large calibre field cannon, and there is some gratification in seeing the tendency now generally established in this direction. Reductions in calibre have produced greater initial velocity, a flatter trajectory, greater range and penetration, and less shock of recoil, with the additional advantage of allowing each man to carry a greater number of rounds. So in recent years instead of bloodshed there has been a battle of re-armaments."

Colonel Theodore Ayrault Dodge, in his "Riders of Many Lands," expresses what most of us have privately thought when reading tales of knight-errantry or inspecting collections of armor, such as that at Dresden and numerous other museums in Europe. He says, speaking of saddles, "When, after the lapse of centuries, saddles came into common use, there grew up two schools of riding,—that of the mailed warrior, whose iron armor well chimed in with his 'tongs on a wall' seat in his peaked saddle, and that of the Oriental, whose nose and knees all but touched. The former was not what we really call a horseman; he was a mere man on horseback. That some of them were noble-looking specimens is vouched for by, say, the statue of Bartolomeo Colleoni, in Venice, easily best of equestrian figures, and surely a splendid ideal in many ways. But the horse was more of a lumbering vehicle than a saddle-beast, a species of conveyance—a gun-carriage, so to speak—for the bulky man of iron, who could no more walk than ride, and when unhorsed was as useless as a dismounted gun. Why the Eastern rider, who is at the other end of the category, and really a horseman, should cling to his extremely short leathers it is hard to say, unless it be from the same ancient notion to

place him the higher above his horse, and therefore make him the more imposing when he stands up in his stirrups to brandish scimitar or matchlock."

Mr. Burnet Landreth, in an interesting address before the Association of Centenary Firms, at their fifth annual meeting, remarks, "Bishop's 'History of American Manufactures' says that in 1750 only the best farmers of many sections had carts upon their farms, and that in 1780 few wagons were to be found, still less carriages, for in colonial days it was considered effeminate for a man to ride in any other way than astride a horse. Wagons were always more abundant in Pennsylvania than in the other States; Braddock's expedition, in 1765, being furnished with one hundred and fifteen Pennsylvania wagons. Mr. Reed, in a letter to Washington, August 3, 1780, said, 'The army has been chiefly supplied with horses and wagons from Pennsylvania, —the quartermaster-general stating that one-half of all the supplies furnished the army have been from Pennsylvania for the past three years.'"

Mr. Chas. H. Lummis, in his last book, "The Land of Poco Tiempo," gives us some of the inscriptions upon the head-boards of the graves in the grave-yard of Fort Bowie, at Apache Pass. Within the high picket-fence, the writer tells us, the white head-boards gleam in the eternal sun, and doves coo upon the narrow mounds. Between its ridges the ground is gay with golden wild poppies and snowy marguerites; and here and there upon some less-neglected grave a buck-horn cactus spread its prickly antlers, or a turk's-head nestles close to the bare gravel. Here one of the first graves as one enters is that, so the board says, of "O. O. Spence. Born in Pennsylvania. Killed by Indians, April 7, 1876." Then comes three or four more, "Killed by Apaches," and next a board bearing the simple inscription, "In memory of Col. Stone, supposed to be." So hacked by his murderers that it was impossible to identify him. The same inscription occurs on the graves of three others.

Another head-board says, "In memoriam of Geo. Knowles, private, Co: H. 32d U. S. Infantry, captured and tortured to death by Apache Indians, May 26, 1868."

Knowles and another private of the Thirty-second Infantry, named King, were acting as guard to the stage down the pass. Just before they reached the plain the stage was "jumped" by Apaches, and the driver instantly killed. The conductor, who was known as "Tennessee," "stood off" the foe for a while, but was soon wounded and overcome. For some reason the Apaches did not butcher him, but carried him off captive. He was afterwards killed in Mexico in a fight between the Apaches and Mexicans. The two soldiers do not appear to

have made any resistance,—no empty shells from their guns could be found. They probably threw up their hands and surrendered. Poor fools! Their captors bound and roasted them alive, with variations. In this little grave-yard at Fort Bowie there are eight other graves, each with the ominous line, "Killed by Apaches," and there are fourteen graves which are marked "Unknown." Yet, in view of all this, there are hysterical people who think the detention of Geronimo and his braves in a comfortable, peaceful village a great aggression upon the rights of man. There is a class of grave-yard inscriptions which do not appeal to one's feelings, as a rule. The stilted encomium of the local magnate or the rich man of the neighborhood is soon detected by even a casual reader. But the epitaphs of sailors and soldiers—some of them very quaint—are always of interest, as showing the working of the human mind under different influences.

Quaint epitaphs are plenty, but those of naval and military origin are often most peculiar. Here is one of a Revolutionary hero which seems worthy of reproduction. It is in a grave-yard at Windsor, in Maine.

"Here lies the body of Rich^{d} Thomas,
an inglishman by birth.
A Whig of '76.
By occupation a cooper
Now food for worms.
Like an old rum puncheon,
Marked, numbered and shooked.
He will be raised again and finished by his Maker.
September 28th, 1824; aged 75.
America, my adopted country,
My best advice to you is this, take care of
Your liberties."

The putting in of the "Englishman" with a small i seems rather a fine touch in this composition. Nothing could be finer than the inscription placed on the monument at Mars-la-Tour, where the Germans buried the dead of both armies, and wrote, "Here brave Frenchmen and brave Germans repose in God."

The French raised a monument at Coruña to the general whose army they drove into the sea, bearing upon it, "John Moore, leader of the English Armies. Slain in battle, 1809."

This, again, would be difficult to excel for dignified simplicity.

There is an inscription on a grave-stone placed over an old sailor of the war of 1812 in the Naval Ground at Philadelphia:

"Faithful below, he did
his duty; but now he's gone aloft."

There was, a year or two ago, a good deal of notice taken, at the time of Tennyson's death, of some of his alleged appropriations of ideas, among others in regard to the celebrated "Crossing the Bar."

The *Army and Navy Gazette* took it up, and the result of the threshing out we took count of. A correspondent of a daily paper wrote, "When I first read Tennyson's 'Crossing the Bar' there arose in my mind the echo of 'some long forgotten strain,' but in the years that have elapsed I could never trace the original thought which persisted for a while in forcing itself upon me. All things, however, come to him who waits, and in looking up a reference in Dr. W. H. Russell's "Letters from the Crimea" I came across a description of the Bluejackets' Cemetery. It is on page 468, and part of it runs:

'No. 9. To J. Tobin: died of wounds received in action.'

Beneath is this quaint inscription:

'I am anchored here below with many of the fleet,
But once again we will set sail our Admiral Christ to meet.'

"Of course Tennyson's thought of meeting his Pilot is a re-creation; but as he was an assiduous reader of the veteran correspondent's letters, may not the seed of that doggerel inscription have lain in the fertile soil of his mind for a generation until it 'bore fruit a hundredfold'?"

While the matter was still under discussion, Dr. Russell's paper printed an inscription from a monument in Greenwich Hospital old cemetery, which shows that the idea expressed by the Laureate was several generations old. The inscription runs:

"Here lies ye body of Mr. Pearce Welch, Lieu^{t} of her Maj^{s} Ship Salisbury in ye year 1708. On the 10th day April they engaged a part of ye Dunkirk squadron, in wch he lost his lower jaw and part of his tongue by a musket ball, after wch he lived six year four months and twelve days by liquids only. He was First Lieutenant of ye Royal Hospital, and died ye 22nd August 1709, aged 59 years.

"Tho' Boras blasts and Neptune's waves have took me to and fro,
In spite of both by God's decree I harbore here below,
Where I do now at anchor ride with many of our fleet,
Yet once again I must set sail our Admiral Christ to meet."
"Eliza Welch his wife died 27th Dec^{r} 1723, æt. 82."

And here are two others, communicated to the same paper,—one is from a very old grave-stone in Selby Abbey Church, Yorkshire, as follows:

"Tho' Boreas with his Blustering Blasts
Has tost me to and fro,
Yet by the handy work of God
I'm here inclosed below.
And in this Silent Bay I lie
With many of our Fleet,
Until the day that I set sail,
My Admiral Christ to meet."

The other lines were written by a brother of Sir Walter Scott, who served in the British navy in most of Lord Rodney's battles, and are

part of an elegy which he wrote on the supposed loss of his own ship in Rodney's celebrated battle of April 12, 1782. The verses give a curious insight into life afloat at that time.

"No more the geese shall cackle on the poop,
No more the bagpipe thro' the orlop sound,
No more the midshipmen, a jovial group,
Shall toast the girls and push the bottle round.
In death's dark road at anchor fast they stay,
Till Heaven's loud signal shall in thunders roar,
Then starting up, all hands shall quick obey,
Sheet home the topsail, and with speed unmoor."
["You will find them in Lockhart's Life of Sir Walter Scott."]

Among the wagons mentioned above as forming part of Braddock's outfit were, no doubt, some of the far-famed Conestoga wagons, first built about 1760 by the German settlers on the Conestoga Creek, near Lancaster, Pennsylvania. "They were likened to ships on wheels, long-bodied, the bottom sills being curved downward in the middle so that the freight had a tendency to press to the centre without slipping fore or aft when passing over hills. Wheels low and of six-inch tread, the body canvas-covered, peaked up at the bow and stern with far-projecting ends rising high above the centre, drawn by six Dutch horses with harness heavy enough to pull a locomotive. An ordinary load was five tons, and a day's travel was fifteen to sixteen miles. These wagons passed in caravans from Philadelphia through Lancaster, crossing the Susquehanna at Columbia or Marietta, and thence over the mountains to Pittsburg. There was also a toilsome route north to Lake Erie. The horses of these wagons, always four in number, often six, were covered with heavily-made harness, and extravagant decorations of bear-skins, bells, and gaudy fringe housings." Even in the youth of the writer these wagon-trains were to be seen, picturesque objects in a diversified and smiling landscape. To accommodate the drivers and business men who accompanied them great hostelries sprung up along the highway,—some still in existence, but most of them gone, having given the name of their well-known sign to some thriving town or village.

The annual report of the Secretary of War is an interesting one in several ways, and especially in regard to the militia.

Every State and Territory with the exception of Florida, Maryland, Nevada, New Hampshire, South Carolina, West Virginia, Mississippi, and Wisconsin submitted reports for 1893. These reports, and facts known of the condition of things in the States which did not report, show that on December 31, 1893, there were about eight million and

a quarter of able-bodied men in the whole country who were available for military service.

If the estimated population (the increase since the last census) was included, there would be about nine million nine hundred thousand men liable for military service. Say that half of these could be brought out in time of need,—and we know from experience that about that number would be forthcoming,—it would make a force of four million five hundred thousand, which would only be limited in usefulness by the ability of the government to supply arms and ammunition.

As for the organized force, excluding the regular army, there are in the States and Territories more than one hundred and twelve thousand men who are organized into regiments and parts of regiments who could, within a very few hours after the receipt of orders, be placed in the field. This number includes nine thousand two hundred and seventy-eight officers.

New York has the largest militia force, amounting, rank and file, to over thirteen thousand. Pennsylvania follows next with eight thousand six hundred officers and men, with a character for efficiency of the very best. Ohio has over six thousand, Massachusetts five thousand six hundred and sixty-six, and South Carolina five thousand five hundred and forty.

Pennsylvania has the largest number of men available for military service, seven hundred and thirty-five thousand six hundred and twenty-two. New York and Illinois have each six hundred and fifty thousand. Idaho has the smallest organized force, only two hundred and thirty-two officers and men, but Delaware does not much excel her with three hundred and thirty.

In noticing the Secretary's report the Albany *Journal* remarks,—

"The war-dogs of Europe might smile at the idea of opposing their drilled and seasoned 'peace-footing' troops with militia; but experience has shown that the militia become veterans in a remarkably short time. The military immediately available in this country is amply sufficient for present needs, while the force ultimately available is the largest in the world. An invasion of the United States would be an undertaking fraught with more danger and uncertainty than it was in 1775."

Washington's Head-Quarters, at Morristown, New Jersey (happily in the possession of an association), is full of valuable furniture and Revolutionary relics. Lately, on the occasion of the annual meeting, on Washington's birthday, Mrs. Herbert Gray Torrey presented to the association two very interesting letters.

One of the letters was from Alexander H. Stevens, of New York, dated October, 1817, at the dictation of his father, General Stevens,

who was one of the party who threw the tea overboard in Boston Harbor, and who served throughout the Revolution as an artillery officer,—at Ticonderoga, Stillwater, Yorktown, and West Point. He was lieutenant-colonel of Lamb's artillery regiment, and witnessed the execution of Major André. He says, "Major André walked unconfined to the place of execution between the two officers his companions and when he reached the spot General Glover officer of the Parade, read aloud the proceedings of the Court Martial and asked Major André in my father's hearing if he had anything to say.

"'Bear testimony,' said he, 'that I die like a brave man.' He then assisted in adjusting his neck-cloth over his eyes & his arms were confined with his pocket handkerchief it was a most solemn scene, & on every face were depicted the deepest emotions of regret—After the body had hung about half an hour it was delivered to his servant who had been sent from New York with the uniform in which he was hung and by him interred."

In this letter the venerable writer says, "During the period of Major André's confinement his table was supplied from that of the Commander in Chief & among other marks of attention shown to the unfortunate captive, two accomplished officers Major Sumner of the Massachusetts Line & I think Captain Hopkins of the Connecticut Line, were assigned to be his companions with a view to afford every consolation his situation admitted of. A Detachment from the several corps of the army amounting to about 1000 men," of which Colonel Stevens commanded the artillery, "was present at the execution. The Gallows was erected on an eminence about one quarter of a mile in the rear of the house in which Major André resided—It could not be seen from that house by reason of the crookedness of the road to it & intervening buildings & trees—That it was not erected previous to the morning of execution General Stevens well recollects for he saw the mechanics returning with their tools from the work of raising it on his way to place of execution about 8 o'clock that morning."

The second letter is one from Captain John Van Dyk, who was a captain in Lamb's regiment of New York Artillery, and is dated New-York, Augt. 1821. The punctuation, capitals, and spelling are as in the original. For remarkable and continued service Van Dyk was one of the real heroes of the war. He was born in New York in 1753, and was nearly seventy when his letter was written relating the events connected with the execution of André, yet his memory seems very perfect in regard to it.

"I was one of four Officers that accompanied him to the fatal Spot & was So near to him that I could hear & see all that Occured dureing the time. A strong guard paraded before the dwelling house where Major Andre was Confined, he was attended in his room Night & day by two American officers, and Sentinels were place' around the House.

there were about Six Steps which led into the Stoop of the house, on the right of these Steps one American Officer with myself was Standing—when Major Andre came out of the front door of the house in Regimentals, hooking his Armes with the two American Officers (his attendants) one on his right & left, he ran down the Steps of the Stoop as quick & lively as tho no Execution was to take place & immediately fell into the centre of the guard a place assigned him. In this Situation the Commanding Officer gave Command, forward March, The whole marched off, Drums & fifes beating & Playing lively tunes, Major Andre & the two Officers keeping time, Major Andre Said, I am very much Surprised to find your troops under so good discipline, and your Music is Excellent. I had taken my Station close on the left of Major Andres left hand officer & Continued in that Station the whole March—the guard marched a Short distance when they wheeld to the left turning a corner of the road, and marched a Short distance when they again wheeled to the left, in order to pass threw a fence, haveing entered a field, they marched forward a Short distance, wheeld to the right & halted—the grown here was level—a little distance in front was a moderate assending Hill, on the top of which the gallows was Erected. In the position where they halted, Major Andre was for the first time in vew of the gallows. Major Andre here said, gentlemen, I am desappointed, I Expected my request (which was to be shot) would have been granted—no answer was given & he continued with his arms locked with those of the Two Officers. In a few minutes the guard marched off, assended the Hill & halted, at this time Major Andre was about twenty feet from the gallows—when he put his hands upon his hips, looked up to the gallows, then bowed his head a little down, vewed his feet, and so up, untill his head rose to its natural position, biting his underlip and Shakeing his head—at which time I discovered a Small flush moveing over his left Cheek (I supposed at the time he looked at the gallows and viewed himselfe from the feet upwards) that he was reflecting upon the untimely end he had come to. In a few minutes the hangman let the waggon under the gallows and the Commanding Officer then Said Major Andre, you will please to get on the waggon, Major Andre advanced to the hinder part of the waggon, puting his hands upon It, made a motion as tho intending to Jump on, but faltering, he put his right knee on, and then raised himselfe up into the waggon, turned himselfe to the guard, placing his hands on his hips."

In the same simple way the gallant artillerist describes, with curious particularity, every stage in the well-known tragedy, saying, "neither did Major Andre struggle in the least—nor did he hang a quarter of the time usual in such Cases—the Commanding Officer Ordered two soldiers to bear him up, one on each side, with one arm under his Shoulders, and one under his thigh—the Commanding Officer then cut

the halter—when the two Soldiers bore him away from the gallows to the Coffin. Major Andre was not Suffered to fall to the grownd, every attention & respect was paid to Major Andre, that It was possible to pay to a man in his Situation—neither did I discover anything in either Officer or Soldier, but a deep Sorrow for Major Andre, and a Strong desire and wish, that the Trator Arnold, shuld have bin Executed In his Stead—and altho the talents of Major Andre as an Officer & his Knowledge of the works at West Point would have been much against the American cause, had he been Spared, Still every Officer and Soldier in the Army would have lifted both hands for the Exchange of Major Andre for Gen[l] Arnold—This Exchange was offered by Gen[l] Washington—but refused by Genl Clinton the British Commander in Chief In New York—so the life of a Traytor was Saved, and Major Andre fell a Sacrefise."

E. SHIPPEN.

NAVAL AND MILITARY NOTES.

NOTES AND DATA ON NAVAL AND MILITARY MATÉRIEL AND ALLIED SUBJECTS.

It is the intention to collect and publish in this department of the "United Service" all information obtainable from current publications and other available sources concerning ships, guns, armor, explosives, small-arms, military and maritime affairs, and kindred subjects. As the data are derived largely from unofficial sources, strict accuracy cannot be expected; but all reports will be carefully examined and compared with others on the same subject, and it is hoped, by this means, to attain fairly correct results. Erratum notices will be published whenever errors are discovered in data previously given. As the development of the present plans for collecting information progresses, it is hoped to secure fuller and more authentic reports.

WAR-SHIPS AND TORPEDO-BOATS.

Argentine.

ENGAGEMENT ON THE PARANÁ RIVER OFF ROSARIO BETWEEN THE ARMOR-CLADS INDEPENDENCIA AND ANDES.

For the past year Argentine has been disturbed by revolutions. At first these were directed against the local governors who had interfered with the freedom of the elections. For reasons unnecessary to state here the revolt at length turned against the central government.

The revolutionists, being short of arms, planned the seizure of the armor-clad *Andes*, on which seven or eight thousand small-arms were stored. This was carried out by her executive officer, Lieutenant Valotta. The captain resisted, but was wounded and pushed off in a small boat. The *Andes* then hastened up the Paraná to Rosario, which was in possession of the revolutionary party and the most active centre of revolt.

At the same time the first-class torpedo-boats *Murature* and *Commodoro Pi* ran away from the torpedo-station at Tigre accompanied by second-class boat *No. 7*. The revolt was considered a just one by a very large portion of the people, and it was supposed that the naval officers were in sympathy with, and would join it. But with a few exceptions they failed to do so. The larger torpedo-boats, expecting to find the fleet in accord with them, ran down into the midst of it in Buenos Aires Roads and were recaptured. In the short fusillade which took place the *Murature* was badly injured. Second-class boat *No. 7* escaped across the Plata to Colonia, Uruguay, and was abandoned by her officers and crew. She was picked up and towed back the same evening by the *Espora*.

The *Independencia* and the *Espora* were sent up the river after the *Andes* as soon as they could get away. They arrived in sight of the anchorage off Rosario, where the *Andes* lay at single anchor, about 10.30 A.M., September 29, the *Espora* leading by half a mile or more. The *Andes* opened fire as soon as the *Espora* came in view, but did no damage. When at 4000 metres an 8-inch shell from the *Andes* fell very close to the *Espora* and she stopped her advance. As the *Independencia* passed her she signaled the distance and the former opened fire. During the action of an hour and a half which followed she gradually reduced her distance to about 1000 metres. The *Andes* was discharging her store of arms when the government

ship arrived. Finding that her superstructure interfered with the fire of her turret guns, a tug, which lay alongside receiving arms, was given a line from the stern and brought her broadside to her opponent. While coming broadside-to a shell from one of the *Independencia's* 12-centimetre (4.7-inch) guns struck the after superstructure a few feet abaft the after side of the armored conning-tower. Its direction made an angle of about 35° with the keel. Passing through the thin plating of the superstructure side in a jagged hole about 6 by 18 inches, it struck the after side of the armored conning-tower, dished out a score about 2 inches wide and 6 or 8 long, and then, notwithstanding how nearly the direction at impact approached the normal, it was deflected, exploding instantly afterwards, the pieces escaping through the starboard superstructure plating in line with the deflected direction. Another 12-centimetre shell struck the forward end of the after superstructure deck, which projected beyond the forward bulk-head (this bulk-head was an armor plate forming the forward side of the armored conning-tower) and formed the ordinary steering platform or station. The force of the blow destroyed or deranged the engine telegraphs and other fittings and wrecked the platform. Several lighter rapid-fire projectiles struck in various places, but the miserable aiming was shown by the fact that several of these struck high up the masts, one at least 30 feet above the top of the superstructure.

By this time the fire had become too hot for the tug, and she let go her line and hastened out of the fight. The *Andes* then fell off to the current. At about this moment, while she still presented her port quarter to the *Independencia*, a 9.4-inch shell struck the armor belt on the port quarter about 20 feet from the stern at an angle of 30° to 40° with the surface of the plate. Its force was so great and the armor of such soft wrought iron that, in spite of the fact that the angle of impact was less than that of the tangent to the ogival and the point of the shell could not bite, it broke its way through in a neatly-punched cylindrical hole. Then, cutting the tiller-chains, it passed across the ship through various light bulk-heads, through the inner plating and backing behind the belt armor on the starboard side abreast the engine-room, and struck near the after edge of one of the plates of the belt, which edge the blow forced outward nearly three inches; broke two or three armor bolts, created an internal dish and an external bulge of small diameter (about 15 inches), through the centre of which the plate was much broken and cracked, the cracks not extending beyond the edges of the bulge. Several small pieces fell out, forming a small crater in the centre of the bulge and opening a more or less irregular hole of small size all the way through the plate. The projectile broke up, but the principal pieces, three in number, remained together, and, still forming one mass of the original shape, passed forward through the backing along the inner face of the plate for about a dozen feet. In entering the plating behind the armor several pieces of it were broken out. One large piece was driven downward and cut the main circulating pipe of the condensers. Another small one was forced through the engine-room, wounding with the flying fragments the chief engineer, an Englishman, and the only person injured on either ship. A few minutes afterwards a shell entered the starboard quarter about 15 feet from the stern-post and a foot or more above the top of the armor belt. It traversed the trunks of half a dozen vertical ventilators, cut two or three bulk-heads, and burst against another about abreast the engine-room. The explosion blew out a short length of a deck plank, and two or three pieces of the shell escaped through the ship's side. The damage was unimportant, as the holes were well above water.

The total number of 9.4-inch shots fired by the *Independencia* was four; of the 12-centimetre (4.7-inch), about twenty. The only hits are described above.

While all this was going on the *Andes* was firing at the *Independencia* with her 8-inch turret guns, but without effecting a single hit, though the *Independencia* is by no means a small target, and the water so smooth that the conditions almost equaled those of a fixed gun and fixed target on shore. In all the *Andes* fired

her heavy guns about twenty-five times. The only projectiles which struck the *Independencia*—glancing blows all of them, and scarcely perceptible—were from small rapid-fire or machine guns, and only two or three of them. No damage whatever was effected. Near the end of the engagement the *Andes* fired her right gun pointed almost as nearly aft as the superstructure would permit. This resulted in blowing out a short length of deck plank, splinters from others, and loosening the fastenings of several. At this time—possibly at this very shot—the right gun was fired without setting up on the compressor. It flew in to the rear of the slide, knocked off the buffers, and jammed the piece so that it could not be used. In this condition it remained when taken posession of by the nationalists.

The commander of the *Andes* now became satisfied of his ultimate defeat, so dropping in-shore he hauled alongside of a wharf and began discharging the remainder of his small-arms. The *Independencia* then stopped firing to avoid shelling the city. The surrender of the *Andes* was demanded of the revolutionary authorities on shore under threat of continuing the firing without regard to resulting damage in the town, and she was given up after a short delay.

The leak from the severed circulating pipe was gaining rapidly, and she was grounded on a sand-bar to prevent sinking, pending repairs which were carried out as rapidly as possibly.

The following description of the *Andes* may be of service in gaining a clear understanding of the above. She is a small coast defense armor-clad of the following dimensions: Length, 186 feet; beam, 44 feet; draught, 9 feet 6 inches; displacement, 1535 tons. She was built, as was also the *Independencia*, by Laird, of Birkenhead, near Liverpool, England, and launched in 1875. The side armor consists of a complete belt of wrought-iron armor 6 inches thick amidships, diminishing to 4.5 inches at the bow and stern. There is but one turret, a little forward of the centre of the vessel, which was originally fitted with 9-inch muzzle-loaders, but which have been replaced by 8-inch high power breech-loaders. The secondary battery consists of two 4.7-inch Armstrong rapid-fire guns, and six small rapid-fire and machine guns. The armor of the turret is of wrought iron, 8 inches thick, increased to 12 inches near the gun-ports. The speed on trial was 9.5 knots, but owing to age and long service this is considerably reduced. Forward and abaft the turret and extending respectively to the bow and stern, are deck-houses or superstructures which are so narrow, however, that they do not interfere with the fire of the turret guns as much as might be expected. The armored conning-tower, which was several times mentioned in the account of the engagement, is a rectangular iron box with sides formed of plates 5 inches thick. It contains the steering and engine telegraphs for use in action, and also serves as a hatch and ventilator to the machinery space. Its sides being in line with the remainder of the superstructure render it undistinguishable from the latter.

The *Independencia* and her sister ship the *Libertad* were fully described in the NOTES for April and May, 1893, but for convenience a short description is given herewith. She is a light draught armor-clad, built for service on the river Plate and its tributaries. The displacement is 2500 tons; length, 230 feet; beam, 43 feet; draught, 13 feet. She has a protective deck extending from stem to stern. Her other armor consists of an 8-inch compound belt along the water-line amidships for about two-thirds the length, and which terminates forward in a thwartship bulk-head, 8 inches thick; aft, in one of 6 inches; two barbettes on the fore-and-aft midship line, one forward, one aft, with 8 inches of compound armor on the exposed sides, and 5 inches elsewhere, and each surmounted by a 5-inch steel shield covering the gun. The battery consists of two 9.4-inch Krupp guns of very recent pattern, four Armstrong 4.7-inch rapid-fire guns, four Maxim-Nordenfeldt 3-pounders, two 1-inch, 3 barrel Maxim-Nordenfeldt machine guns, and two machine guns of musket calibre. The speed on trial was 13.25 knots with natural draft. The *Independencia* was only completed in the spring of 1893.

The features of this engagement viewed from a technical stand-point are absolutely valueless as object-lessons. Nevertheless, there is one fact brought into notice which has been emphasized again and again by the results of almost every engagement in which armor-clads have taken part,—the danger of thin armor. In the *Huascar's* fight with the Chilean squadron, one shot after penetrating one side of her thinly-plated turret exploded against the other and killed or wounded every man in it. A few minutes later a second shot exploded in precisely the same way and killed or *mortally* wounded every man of a new turret crew. A third exploded similarly in the conning-tower, wrecked it and the mechanism it contained, including the fighting steering wheel, blew Admiral Grau to pieces, and killed his flag-lieutenant. In each case the wood backing behind the armor in which the projectiles buried themselves, and the iron plating which supported it, only served by the fragments blown out to furnish additional missiles of destruction and death. Had the *Andes* been unarmored no leaks would have been started, no one hurt, and the engines would not have been partially disabled. Both projectiles which struck below the deck would have passed through both sides and escaped beyond without exploding, as half a dozen ordinary bulk-heads seem to have been insufficient to cause explosion. Of course thin armor must occasionally be used, but the possible dangers it introduces must be carefully considered, and as far as may be avoided, instead of building —as the *Dupuy de Lôme*, and others of her type may prove to be—perfect projectile traps.

TORPEDOES, TORPEDO-NETS, AND TORPEDO-GUNS.

The experiments which were conducted at the Newport Torpedo Station in December to determine the effect of the explosion of a torpedo on a submerged hull, like that of a submarine torpedo-boat, were inconclusive. An old Lay torpedo was used, moored in eight fathoms of water, three fathoms below the surface. Inside it were placed live rabbits and chickens. The explosive, 100 pounds of gun-cotton, was placed at a distance of 420 feet. Immediately following the explosion the torpedo sank, and it was supposed that it was breached by the shock. But upon recovery, several days later, it was found to be uninjured, but full of water. Of course the animals were dead,—probably drowned, as the hull appeared to have suffered so little. It is supposed that the shock loosened the bolts of the man-hole plates and admitted the water in that way.

GUNPOWDER AND EXPLOSIVES.

Dr. Wellorech, of Germany, has recently submitted to the Bureau of Ordnance, War Department, samples of a smokeless powder invented by him, for tests by the ordnance officers. He claims for the powder that it will retain all its properties under all extremes of temperature; that it is a pure nitro-cellulose powder; that its manufacture is under such compact conditions that perfect uniformity can be secured and velocities and pressures modified regularly between considerable limits. It is considered very desirable by the authorities of the War Department to obtain a powder which does not contain nitro-glycerin, and Dr. Wellorech's samples will soon be given an exhaustive test in this country.—*Army and Navy Journal.*

The Chilworth Powder Company, of England, are erecting machinery at their factory for the manufacture of a new smokeless sporting powder. It is of the nitro-cellulose class, and is the result of many years' experiments.

According to all reports that have been made public, cordite continues to give satisfaction in the British services, both army and navy. Mr. Anderson, director-general of the royal ordnance factories, states that 39,000,000 pounds have been made at the royal laboratory, and that no other powder is being manufactured there. He also says that he has never heard any complaints of it. Referring to the statement that cordite is officially declared to be safe up to a temperature of 120° F., a naval officer of high rank, in the *Army and Navy Gazette*, among

other things calls attention to the fact that the temperature of guns after a few rounds fired rapidly is much above 120°, and that whether cordite will stand such high temperatures or not is yet in doubt. He also states that its safety and adaptability for use as a bursting charge for shells do not appear to have been decided.

SMALL-ARMS AND EQUIPMENTS.

Referring to a report of the chief of ordnance giving results of experiments made by cavalry officers with the new 38-calibre revolver, Lieutenant Eben Swift, Fifth Cavalry, says in the *Cavalry Journal*, "Meanwhile, it is interesting to note that after some sixty years' struggle with the revolver principle, a new idea has struck the maker of a pistol. A German has made his appearance at the World's Fair with a model of a pistol which combines the properties of the Maxim gun and the Lee magazine. You pull the trigger and the pistol fires, reloads and cocks by force of recoil, and so on for five shots. Those who have seen it work say that great things may be expected of it. It seems to have created some consternation among the great manufacturers, and they are all said to be working to get the patent rights in this country."

In reference to various notes that have appeared in this paper on the subject of expanding bullets for the .303 rifle, we have now to report that the Jeffery bullet has been combined with the Tweedie bullet. Its present form is as follows: The base is covered by the mantlet, a small nose of lead about one-eighth inch in diameter being visible at the point; the lead is soldered to the mantlet, the four slits of the Jeffery bullet remaining. In bending in the vise the nose crushes up slightly, the expansion, instead of as before starting in the centre, now travels from the point, and is produced by the mass of metal behind the expanded portion; this state of affairs is theoretically good, as the greatest available power is applied to the parts undergoing expansion. The bullet has been used this season for deer-shooting in Scotland, and we understand that the results are very satisfactory; the entrance hole being small, while farther in it is as large as that of a .450 Express rifle. We have to state that the Jeffery patent is now complete, the final specification having been accepted at the Patent Office on July 8 of this year.—*Arms and Explosives.*

A curious experiment is said to have recently taken place at Grenoble to test the efficacy of long-range rifle-firing. Colonel Andre, of the Second Regiment of Artillery, having expressed the opinion that the fire of infantry at 2000 metres (2187 yards) would prove quite ineffective, his assertion was promptly traversed by Colonel Lallement, of the One Hundred and Fortieth Regiment of the Line, who undertook to refute its accuracy by organizing a series of trials at that range. To insure thorough impartiality, a committee of artillery officers was selected to supervise the experiments and verify the results, which proved so successful that more than 50 bullets out of 300 fired struck the target. Colonel Andre is said thereupon to have declared himself satisfied that under similar conditions it would be impossible for artillery to withstand such a fire, and further that it would be impossible even for a battery to take up a position on the open ground.—*Army and Navy Journal.*

After rising into high favor and continuing a favorite for a long time, the position finder is rapidly losing ground in the British army. It is said to be too heavy and complicated, and too slow of action.

The practical experiments recently carried out at the camp of Chalons with the indirect system of laying guns invented by Captain Froissard are stated to have been highly successful. It is asserted that, by the system adopted, a group of batteries placed behind a mark were able to point their guns as accurately as if the guns were in the open. The value of the discovery of Captain Froissard is so important that every effort is to be made for preventing the secret of his system from transpiring.—*Army and Navy Journal.*

Some of the finest photographs from a balloon have recently been made by a Philadelphia photographer. The use of such pictures must eventually be recognized. Their value in map-making or in constructing a railway must not be underestimated. In the next great war there is no doubt but that aerial photography will play an important part in securing photographs from above the enemy, and thus obtaining information regarding their strength, position, and movements. To avoid loss of life the camera can be attached to a captive balloon and the plates changed and shutters released by means of electricity from the ground.—*New York Herald.*

MISCELLANEOUS MILITARY NOTES.

The Danish Army.

The opposition to military expenditure was until lately strong at Copenhagen, and projects for increasing the army and improving the fortifications were in the air for ten years before any practical steps were taken. Leaving the fortifications for future description, we find that the effective strength of the Danish army now is exactly double what it was at the time of the war of 1864. This army of 60,000 combatants and 20,000 non-combatants is raised by compulsory service. Each citizen is liable for sixteen years' service in all. During the first eight years he is enrolled on the first ban, and for the next eight on the second ban; but during his period of active service he has only to be on duty for a certain number of months in each year,—six months for the infantry, nine for the cavalry, and five for the artillery. The first ban army is composed of 33,000 infantry, 2500 cavalry, 5000 artillery, and 1500 engineers. The second ban includes 14,000 foot, 3000 artillery, and rather less than 1000 engineers. The average number always with the colors is given at about 20,000 men, and the infantry are armed with a magazine rifle carrying four cartridges and named the Jorgensen. The army is divided into two divisions, each composed of two brigades, and the reorganization of the army in recent years has been mainly carried out by the War Minister, General Bahson, with the personal cooperation of the king.—*London Times.*

According to the recent report of the Italian Minister of War to the Chamber of Deputies, the minimum peace effective force of the Italian army was, on July 1, 1893, the same as two years before, but the maximum effective is greater. The war effective which could be mobilized on July 1, 1890, was 791,000, while in 1893 it was a million, and the time required for mobilization has been reduced by six days. The department has 1,625,000 Vetterli repeating rifles, with a novel system of magazine attachment. Fifty thousand new rifles (Carcano) have already been distributed to the troops, 25,000 more are on hand, and the manufacture of the weapon is proceeding at the rate of 11,000 per month. As regards artillery, the report announces that all the 9-centimetre guns are new and their ammunition and equipments excellent. The garrison artillery has been increased during the last three years by 250 very powerful guns.

The latest returns, to January 1, 1894, of the British regular forces at home and abroad, show that the total number of officers and men borne upon the regimental rolls (exclusive of the Indian native army) is very little below 220,000, and about 2000 more than were in the ranks a year ago. Of these, nearly 20,000 are cavalry, 37,000 artillery, 7500 engineers, 143,000 infantry, 5200 colonial troops, 3500 army service corps, and 2500 medical staff corps, the remainder being made up of the smaller departmental corps. Great Britain and Ireland retain nearly half the regular army for home service, there being little short of 107,000 troops in the three kingdoms,—74,000 in England and Wales, 28,000 in Ireland, 3500 in Scotland, and the residue in the Channel Islands. Aldershot shows the largest home aggregation, the Duke of Connaught having there 15,000 men, while the Metropolis and Home District have 8500, Portsmouth and the Southern District, 9500; Plymouth and the Western, 7200; Dover and the Southeastern, 7500; Woolwich and the Thames, 9400. Away from home, India always

absorbs the greatest number of regular troops, and the men of the Imperial army there now reckon up about 77,000, or about 600 more than at this time last year. Of these, 15,500 are in Burma. The British strength in Egypt has been somewhat increased, and the 5000 men there are nearly 2000 more than a year ago, the principal increase being in infantry of the line. The regular forces scattered over the colonies in all parts of the world are 31,000 in number, and the Mediterranean stations occupy a considerable portion of these. Gibraltar has in its garrison 5000 men, and Malta 8000, while Cyprus has only about 600, mostly infantry and no artillerymen. After these stations have been reckoned, the remainder of the 31,000 give 3300 to the Cape and Natal, 1000 to the West African Settlements (where the regular troops are principally the colored soldiers of the West India regiments), 2900 to Hong-Kong, 1500 to the Straits Settlements, 1600 to Ceylon, 1400 to Nova Scotia (the only portion of the Dominion of Canada garrisoned by Imperial troops), 1600 to Jamaica, 1400 to Bermuda, 1300 to Barbadoes, 800 to Mauritius, and only 200 St. Helena. Besides the home islands, India, and Egypt, Natal is the only part of the world where British cavalry is stationed; home and India have all the horse artillery; Egypt has field artillery as well as a cavalry regiment, the former being an addition since last year; and the mountain artillery are confined to home, India, and South Africa, while the garrison artillerymen, numbering in all nearly 18,000, are to be found in all the colonies (as well as at home and in India), with the exception of Cyprus, Natal, Penang, and the Gambia.—*London Times.*

In the new drill regulations for the German artillery the general principles of handling artillery in action are thus summed up: "The fire-action will, as a rule, be commenced by artillery. Here it is important in most cases to be able to develop a *superior number of guns* from the very outset, and to produce a *mass effect* at an early period. Since the *selection of the first artillery position* frequently has a decisive effect upon the general deployment, but is always dependent upon the tactical plans of the commander of the force, the artillery commander must receive orders upon this point, as also as to what force of artillery is at first to be developed. The *fire effect of artillery* should principally be utilized at ranges *beyond the zone of effective infantry fire*, but it must be laid down as a principle that our own infantry must never lack artillery support; therefore *at decisive moments artillery must never shrink from the very heaviest infantry fire.* Artillery is, as a matter of principle, protected by advanced infantry from the fire of hostile infantry. As a rule, artillery has no need of special protection. Every body of troops in the vicinity of imperiled batteries is bound to render assistance. *A battery which has exhausted its ammunition* must not retire, but must await the arrival of ammunition in its fighting position. Batteries in action are not relieved, but are supported by fresh ones arriving. Even heavy losses are no reason for the evacuation of a position. Retirements are, as a matter of principle, commenced at the walk. *Earth-works for purposes of protection, especially of the men, against the enemy's fire* are always advisable, even in an offensive action, when there is time for their construction. In prepared defensive positions they are to be employed upon an extensive scale. Cover for limbers and ammunition-wagons will only be practicable in long-prepared positions or in siege warfare. In order to diminish loss, it is advisable to order the *personnel* of the battery to kneel down when under fire. Artillery must gain protection against surprise by its own watchfulness, in addition to the protection afforded by the other arms. When the fighting position is occupied, attention should especially be directed to an unprotected flank, and every flank battery is, without any special instructions, responsible for reconnoissance to the flank. Should hostile cavalry get into the battery, the struggle is continued with the revolver, and is by no means hopeless. Officers and men get between the wheels; the carriages of the lines of wagons close together. Horse batteries are especially adapted for speedily reinforcing a threatened point

or utilizing favorable moments in the action. *Direct fire is to be preferred to indirect fire;* but the latter will have to be used when the ground or the state of the action do not permit of direct fire. In some cases isolated batteries, hidden from view, and difficult of discovery by the enemy, may, by the effect they produce in a specified direction, afford the means of gaining the superiority of fire."

MISCELLANEOUS NOTES.

Germany is about to establish a naval station at Wismar, Mechlenberg-Schwerin, and to make Dantzig a first-class military port. These measures are regarded as Germany's reply to Russia's creation of a military port of Libau.

The Manchester Ship-Canal was opened with appropriate ceremonies on January 1, 1894. It was begun in 1887, and the total cost is about £15,000,000. The sea end is at Eastham, on the Mersey estuary, a few miles above Liverpool, but on the Cheshire side. The total length of the main canal is 35.5 miles, and the minimum depth 26 feet. The depth on the sills of all locks is 28 feet to allow of future dredging and deepening of the present channel to 28 feet if found desirable in the future. For about 30 miles of the length of the canal it is 172 feet wide at the surface and 120 feet at the bottom; in the upper 5 miles it is 50 feet wider. For a very short distance it is only 92 feet wide in the clear. The water-level at Manchester is 70 feet above mean tide-level in the Mersey. This elevation is overcome in five sets of locks. Each set of locks consists of two or three locks of different sizes placed side by side. At Eastham there are three such locks, respectively 600 by 80, 350 by 50, and 150 by 30. The upper locks are in pairs only, with sections cut off by intermediate gates.

The experiments with electrical propulsion on the Erie Canal, referred to in the NOTES for August, 1893, were had in November last. About a mile of canal near Rochester was equipped with overhead wires. The trolley-poles were about 12 feet long and allowed several feet lateral divergence. A steam canal-boat, 98 feet long and drawing 6 feet of water, was used. The engines were removed and two 25-horse-power Westinghouse motors were fitted to the shaft driving the screw directly. The designed voltage was 500, but as the available current was derived from the mains of the Rochester Street Railroad Company, only 350 could be obtained. With 175 tons of sand and a number of people the speed was 3.5 to 6 knots. On November 18 the boat was shown to be able to haul a tow of six ordinary canal-boats at a rate of 4 to 7 miles per hour, the boat itself carrying 110 tons of freight. The electrical equipment was supplied by the Westinghouse Company and the expense of the experiments was shared by that company, by the Niagara Falls Power Company,—which expects to furnish a large part of the electrical power needed,—and by the State. The cost of electrical propulsion and towage will, it is said, be unquestionably much cheaper than towage by horses and mules, or even by steam, while transportation will be greatly quickened and be rendered more regular and reliable. The present appropriation (made by the State) is not exhausted, and careful tests will be made of the loads, speed, efficiency of apparatus, etc.

L. S. VAN DUZER,
Lieutenant U.S.N.

PHILIP ANDREWS,
Ensign U.S.N.

SERVICE SALAD.

A History of the United States Navy.

D. APPLETON & Co., New York, have lately published the first volume of "A History of the United States Navy from 1775 to 1893. By Edgar Stanton Maclay, with Technical Revision by Lieutenant Roy C. Smith, U. S. Navy."

The volume, a stout octavo of nearly six hundred pages, brings the subject down to the year 1814. It is an attractive book, in paper, type, and binding, and the matter will be found not only valuable but interesting, differing in the latter respect from most naval histories, which (it must be confessed) are rather dry reading to any but professional men. Mr. Maclay does not neglect the figures and details which enable us to judge of the relative force of squadrons or single ships, but he also gives incidents of an interesting and even personal kind which keep up the interest of the general reader, who, perhaps, is little versed in naval details.

To do this he has systematically devoted himself to the subject, and has even visited France for the purpose of consulting the French naval archives in Paris. We may incidentally remark that the result of this search has given us three chapters upon the naval wars with France, of 1799 and 1800, which make clear many points in regard to which most people are a little vague, even if they have any knowledge at all of that singular episode in our history.

One great reason for the want of knowledge and of interest in naval matters among the mass of our people is, that no popular work of this kind has heretofore been published, whereas this book is one eminently fitted, by its matter and style, for general readers, while adhering closely to fact, and giving many details which we have never seen grouped in one publication before.

Without wishing to detract from the great merits of such works as Cooper, Roosevelt, Emmons, and others, we may illustrate our meaning in the following manner. We suppose these books and Maclay's to be upon the shelves of a popular library, and that an ordinary reader comes in bent upon information upon our naval history. He glances at the first, and is somewhat taken aback by the severely technical descriptions of actions, given without much connecting history. Then he opens Maclay's book, and sees at a glance that it gives him all he needs to know.

But to return. The author, after visiting France and having the archives of that nation opened to him, endeavored to avail himself of the same source of information in England, but was unsuccessful in this, as the English Admiralty regretted that "the regulations precluded all public inspection of Admiralty records after the year 1800." Fortunately, an immense mass of contemporary information exists, not only in the library of the British Museum (which Mr. Maclay used), but also in the periodicals of our own country, especially in regard to the events of 1812–15, and, as a consequence, we have in part third of this first volume twelve chapters devoted to that period. At that time the British navy was acknowledged to be supreme, having matched its strength against the combined navies of all the European maritime nations with perfect success. The author quotes from an influential London paper of June 10, 1812, "America certainly cannot pretend to wage war with us; she has no navy to do it with;" and, indeed, the English navy had been very

seldom defeated, either in fleet actions or those between single ships. But, to the surprise of English naval men, the royal navy was defeated in fifteen out of eighteen naval engagements, while our cruisers and privateers grievously crippled British commerce, so that loud demands were made for peace at the end of the second year. When the news of the capture of the frigate "Java" by the "Constitution" reached England, the London *Times*, on March 13, 1813, contained the following remarks: "The public will learn with sentiments which we shall not presume to anticipate that a third British frigate has struck to an American. . . . This is an occurrence that calls for serious reflection,—this, and the fact stated in our paper of yesterday, that Lloyd's list contains notices of upward of five hundred British vessels captured in seven months by the Americans. Five hundred merchantmen and three frigates! Can these statements be true? And can the English people hear them unmoved? Any one who had predicted such a result of an American war this time last year would have been treated as a madman or a traitor. He would have been told, if his opponents had condescended to argue with him, that long ere seven months had elapsed the American flag would have been swept from the seas, the contemptible navy of the United States annihilated, and their marine arsenals rendered a heap of ruins. Yet down to this moment not a single American frigate has struck her flag."

Many of the officers who contributed to our success in this war had received their training in the Tripolitan War, a few years earlier; and Mr. Maclay devotes five chapters to this episode in our naval history, grouping the causes, the action, and the result in a very satisfactory manner.

As a specimen of the personal anecdotes distributed throughout this volume we may quote the following: "In the year 1803, while the frigate 'President' was detained in Malta by bad weather, the officers were thrown into a society where it was the fashion to speak contemptuously of anything that pertained to the United States, and especially of the navy; and one evening while Midshipman Joseph Bainbridge and some of his messmates were in the lobby of a theatre, a young British officer, the secretary of Sir Alexander Ball, the governor of the island, said, with the intention of being overheard by the Americans, 'Those Yankees will never stand the smell of powder,' and followed by rudely brushing against Midshipman Bainbridge. The latter promptly knocked the offensive officer down, and a challenge followed. Lieutenant Stephen Decatur acted as second to young Bainbridge, and selected pistols at four paces. The governor's secretary was an expert duelist, but his second objected to the distance, remarking, 'This looks like murder, sir;' to which Decatur replied, "No, sir, this looks like death; your friend is a professional duelist; mine is wholly inexperienced.' And on this footing the two men faced each other. Decatur gave the warning, 'Take aim!' and at the word 'Fire!' Bainbridge discharged his weapon, and the ball passed through the secretary's hat, while the latter missed his aim entirely. The men were again placed face to face, and this time the Englishman fell, mortally wounded."

We shall look with interest for the second volume of this interesting book, which will have the Mexican and Florida Wars, the part of the navy in the great Rebellion, and minor operations and expeditions to deal with.

If we might venture a suggestion to so well-equipped, industrious, and able a writer as Mr. Maclay, it would be that, when his second volume is well through the press, he might set about a history of American privateering,—a field comparatively untilled, and a subject of the greatest interest to any one interested in nautical affairs.

E. S.

Lines written during a Storm at Sea.

Our bark upon the ocean deep and free
  Floats, wildly tossed, a tiny little speck.
How gallantly—("She's shipped another sea,
  And there's my ink upset upon the deck.")

How gallantly she wrestles with the storm!
Now mounting on the wild waves' topmost peaks,
And then—("I wonder where that water's from.
By all the powers of ill, my air-port leaks!")

And then she slowly sinks down, down again,
Until the dark waves seem to close around.
Oh, how—("She seemed a little steadier then.
I wonder if the wind is going down.")

Oh, how I love old Ocean in his might,
When by the tempest to wild fury lashed,
For—("I fear we'll have no tea to-night;
The pantry-boy reports the teapot smashed.")

For I have ever been the ocean's child,
And to its praises I will turn my lyre.
("The cook reports 'the taters are not biled,'
And that the sea puts out the galley fire.")

I love to listen to his angry roar,
And see his wild waves kiss the sullen sky.
("Boy, bring a swab to dry the floor.
Alas! the boy's too sea-sick for reply.")

One thing, old Ocean, thou hast told to me
In thy deep-toned and never-ceasing roar:
That is, that poets who write of the sea
Don't often go, themselves, far from the shore.

And now, fond youths, who nightly dream how sweet
A life upon the ocean wave would be,
Take my advice: sell peanuts, sweep the street,
Dig, delve, do anything but go to sea.

CASPAR SCHENCK,
U. S. Navy.

The Army Officer's Examiner.[1]

AMONG the many valuable technical books furnished the army there is none that will probably be received with greater satisfaction than this work. The volume itself is one of the handsomest military books that has been published, and the labor expended in its preparation shows in every line of its pages, for it not only contains *four thousand five hundred and fifty-one* clear and concise questions on all subjects prescribed for the examination of all officers of the line and of the quartermaster's and subsistence departments, but gives brief and clear answers to each, thus enabling the student to concentrate his thoughts upon the points dilated on to a great extent in the text-books. An officer who has received a copy of the work writes as follows:

"I have looked over it carefully, having also thoroughly studied the course, in preparation for examination, and I am confident that it will meet with success. It is simple, concise, and complete, and will fill an indispensable want. It may not take rapidly at first, but in the end will become an invaluable *aide-mémoire* when it becomes thoroughly known. At this post the officers commend it, and it should not surprise me to find it in full use next Lyceum season. The matter—or rather meat—is gathered in a convenient nut-shell. Financially, I hope it will be successful; but, outside of that, I am sure it will be appreciated as a self-examiner for an officer already prepared for examination. It is a friend in need. I do hope that the War Department will adopt it for the use of examining boards. It exhausts the entire course and simplifies it very much. An officer prepared to answer the questions contained in it is fully up professionally. I have loaned my copy generally to all who desired to look over it, and it has met with general commendation."

Laying aside its value to the officers of the regular army, this work must, of its own merit, find its way into the hands of the National Guard of the

[1] The "Army Officer's Examiner," by Lieutenant-Colonel William H. Powell, Eleventh Infantry, United States Army. John Wiley & Sons, New York, 1894.

country, to whom we can conscientiously recommend it. There are *eighteen* States whose military code requires the officers of their regiments to be examined. In the "Army Officer's Examiner" will be found 199 questions and answers on guard duty; 246 on military law; 158 on simple field engineering; 52 on signaling; 583 on cavalry drill; 459 on light artillery drill; 878 on infantry drill; 508 on hippology; 168 on fire discipline; 590 on minor tactics (which covers all the ground of outpost, advance-guard, patrols, attack and defense of each arm of the service and of the three arms combined); 102 on military topography; 292 on army regulations (quartermaster's and subsistence departments); and 196 on troops in campaign. Whether or not the scope of the examination for officers of the National Guard be great or small, the questions and answers for the same will be found within the covers of this valuable book. Such subjects as guard duty, military law, minor tactics, and troops in campaign, in addition to the drill of the arm of the service to which the officer belongs, every officer of the National Guard should be familiar with, and there is no better means of gathering the information in compressed form than from the "Army Officer's Examiner."

As a text-book for military schools and colleges there is nothing to equal it in its comprehensiveness and compactness.

No Privates!

(*From the Cleveland Plain Dealer.*)

THE "General" tells, with swelling pride,
How the fires of battle gleamed,—
Of the slaughter of men "on the other side,"
As the shell and shrapnel screamed;
How "we charged the foe like the mighty wave
Of a wild and stormy sea."
But, in that rush of the true and brave,
The Private—where was he?

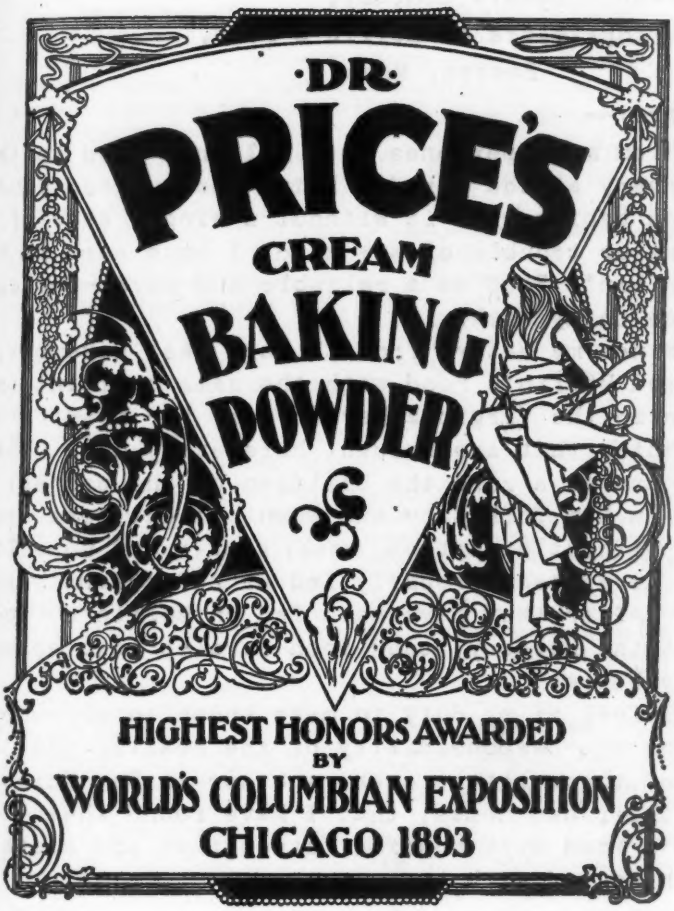
The "Colonel" boasts how his horse fell
On Georgia's blood-stained hills;
How he stemmed the wave of that battle hell,
Avenging his country's ills;
How the ghastly heaps of the gallant slain
Bestrewed the slippery ground;
But we study the tragic tale in vain,
There were no Privates 'round.

Oh, the "Major's" sword, it was red with gore!
And great was the foe's alarm,
As they charged and halted and fled before
The swing of his mighty arm;
But Freedom burnish'd her epaulettes
As she swatted the hosts of sin,
And the lonely pensioner still forgets
That the Privates were not in.

How brave they flew, at their country's call,
To the outposts, far in front!
"Generals," "Colonels," and "Majors" all
To strive in the battle's brunt;
And the "Captains" stand, ten thousand strong,
To tell how the thing was done;
But where was the "Private" in that throng?
Alas! there was not one!

Indisputable.

Why spend $1 for a bottle of medicine when one box of Beecham's pills, costing only 25 cents (annual sale exceeds 6,000,000 boxes), will cure most diseases? This is because constipation is the cause of most ailments and Beecham's pills cure constipation. A valuable book of knowledge, mailed free, on request, by B. F. Allen Co., 365 Canal Street, New York.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PRICE'S
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BY
WORLD'S COLUMBIAN EXPOSITION
CHICAGO 1893

Virginia Day Nursery, 625 E. 5th Stre
New York, N. Y.

April 12, 189

The Doliber-Goodale Company,
Proprietors of Mellin's Food,
Boston, Mass.

Dear Sirs:—

From my experience with Mellin's Food in the Day Nursery at the World's Fair, where I fed four thousand babies with it without a single case of sickness or trouble of any kind, I have come to loo upon Mellin's Food as a reliable and never-failing resource in my work.

Since my return from Chicago last November, I have used Mellin's Food with the same certainty and success in the Virginia Day Nursery for feeding the many babies that are brought here every day. These babies are as a rule the children of the poorest people in New York City and when brought here are, almost without exception, weak, sickly and unhealthy having never been properly fed or sufficiently nour ished. After they have been fed on Mellin's Food here at the Nursery, they soon develop into sound, healthy babies

I feel it my duty to make known to all who ar carrying the responsibility of the health, yes, the lives of these little ones, whether in Day Nurseries or in their own homes, that I have found that Mellin's Food will nourish, strengthen and sustain the babies fed with it.

Sincerely yours,

(Miss) Mayor Hall

MILITARY ORDER OF THE LOYAL LEGION OF THE UNITED STATES.

Maine Commandery.

Stated meeting held May 2, 1894.

To THE FIRST CLASS.—Lieutenant Edward Pendleton, U.S.V.; Captain James M. Thompson, U.S.V.; Lieutenant Henry M. Bearce, U.S.V.

Massachusetts Commandery.

Stated meeting held May 2, 1894.

To THE FIRST CLASS.—Acting Ensign Daniel B. Hallett, U.S.N.; Captain Albert W. Hayes, U.S.V.

To THE FIRST CLASS (by inheritance).—William B. Handy, Rufus A. Soule.

California Commandery.

Stated meeting held May 2, 1894.

To THE FIRST CLASS.—Colonel Andrew Wetstein, U.S.V.; Major M. A. Southworth, U.S.V.

Illinois Commandery.

Stated meeting held May 10, 1894.

To THE FIRST CLASS.—Captain Geo. A. Gale, U.S.V.; Lieutenant A. O. Hall, Major J. H. Widmer.

To THE FIRST CLASS (by inheritance).—Harry M. Slaymaker.

To THE SECOND CLASS.—George S. Ballard.

Missouri Commandery.

Stated meeting held June 2, 1894.

To THE FIRST CLASS.—Colonel Robert Buchanan, U.S.V.; Captain Gotthold Louis Werth, U.S.V.

To THE FIRST CLASS (by inheritance).—Frank P. Kohr, Evans R. Darlington.

TRANSFERS.

Massachusetts Commandery.

Captain Sherman P. Cooley to New York Commandery; Colonel Clayton Hale, U.S.A., to Iowa Commandery.

California Commandery.

Colonel Samuel Ovenshine, U.S.A., to Illinois Commandery; Major P. H. Bailhache, U.S.V., to New York Commandery.

Illinois Commandery.

Major David D. Wheeler, U.S.V., to District of Columbia Commandery.

NECROLOGY.

Maine Commandery.

Lieutenant Henry M. Bearce, U.S.V., May 5, 1894.

Massachusetts Commandery

Captain George W. Le Favor, U.S.V., April 6, 1894.

Illinois Commandery.

Major W. D. Crooke, U.S.V., April 27, 1894.

Reports of elections for officers of different Commanderies:

Pennsylvania Commandery.

Commander, Brevet Major-General David McM. Gregg, U.S.V.; Senior Vice-Commander, Acting Paymaster Thomas S. Harrison, late U.S.N.; Junior Vice-Commander, Brevet Brigadier-General Charles G. Sawtelle, U.S.A.; Recorder, Brevet Lieutenant-Colonel John P. Nicholson, U.S.V.; Registrar, Colonel H. Earnest Goodman, U.S.V.; Treasurer, Assistant Engineer Frederick Schober, late U.S.N.; Chancellor, Brevet Brigadier-General William L. James, U.S.V.; Chaplain, Chaplain Henry C. McCook, D.D., Forty-first Illinois Infantry; Council, Brevet Lieutenant-Colonel William A. LaMotte, U.S.V.; Captain Henry B. Seely, U.S.N.; Pay-Director Henry M. Denniston, U.S.N.; Captain John P. Green, U.S.V.; Captain W. W. Frazer, Jr., Sixth Pennsylvania Cavalry.

Maine Commandery.

Commander, Brevet Brigadier-General George Varney, U.S.V.; Senior Vice-Commander, Brevet Brigadier-General Isaac S. Bangs, U.S.V.; Junior Vice-Commander, Paymaster Wm. H. Anderson, U.S.N.; Recorder, Brevet Major Henry S. Burrage, U.S.V.; Registrar, Brevet Major Holman S. Melcher, U.S.V.; Treasurer, Captain Thomas J. Little, U.S.V.; Chancellor, First Lieutenant Charles W. Roberts, U.S.V.; Chaplain, Chaplain John Smith

Sewall, U.S.V.; Council, Captain Charles E. Nash, U.S.V.; Major Charles Walker, U.S.V.; Captain Charles W. Ford, U.S.V.; Lieutenant Wainwright Cushing, U.S.V.; Lieutenant Samuel L. Miller, U.S.V.

Massachusetts Commandery.

Commander, Brevet Lieutenant-Colonel Henry L. Higginson, U.S.V.; Senior Vice-Commander, Brevet Brigadier-General Charles L. Peirson, U.S.V.; Junior Vice-Commander, Pay Director Edward May, U.S.N.; Recorder, Colonel Arnold A. Rand, U.S.V.; Registrar, Colonel Charles E. Hapgood, U.S.V.; Treasurer, Brevet Major William P. Shreve, U.S.V.; Chancellor, Brevet Major Andrew Robeson, U.S.V.; Chaplain, Rev. Edward Everett Hale, D.D.; Council, Captain George N. Carpenter, U.S.V.; First Lieutenant James N. North, U.S.V.; Brevet Major-General George H. Nye, U.S.V.; Surgeon Augustus P. Clarke, U.S.V.; Acting Volunteer Lieutenant C. Webster Wilson, late U.S.N.

California Commandery.

Commander, Captain Charles Mason Kinne, U.S.V.; Senior Vice-Commander, Brevet Brigadier-General William Rufus Shafter, U.S.V. (Colonel U.S.A.); Junior Vice-Commander, Chief Engineer Joseph Trilley, U.S.N.; Recorder, Brevet Lieutenant-Colonel William Renwick Smedberg, U.S.A.; Registrar, Lieutenant Horace Wilson, U.S.V.; Treasurer, Captain John Charles Currier, U.S.V. (Brevet Captain U.S.A.); Chancellor, Brevet Lieutenant-Colonel Jesse Beech Fuller, U.S.V.; Chaplain, Post Chaplain John Harrison Macomber, U.S.A.; Council, Lieutenant Samuel Woolsey Backus, U.S.V.; Brevet Major Ernst August Denicke, U.S.V.; Paymaster Henry Titus Skelding, U.S.N.; Captain Edward Tracy Allen, U.S.V.; Captain William Theodore Yeatman Schenck, U.S.V.

Wisconsin Commandery.

Commander, Captain George E. Sutherland, U.S.V.; Senior Vice-Commander, Lieutenant Henry B. Harshaw, U.S.V.; Junior Vice-Commander, Captain A. J. Cheney, U.S.V.; Recorder, Captain A. Ross Houston, U.S.V.; Registrar, Chandler P. Chapman, U.S.V.; Treasurer, Major Moses Harris, U.S.A.; Chancellor, Surgeon Hugo Philler, U.S.V.; Chaplain, Rev. G. Mott Williams; Council, Lieutenant H. A. Valentin, U.S.V. (Chairman); Lieutenant H. T. Drake, U.S.V.; Lieutenant F. A. Copeland, U.S.V.; Captain F. W. Oakley, U.S.V.; Mr. Andrew Hathaway.

Illinois Commandery.

Commander, General Joseph B. Leake; Senior Vice-Commander, General Judson D. Bingham; Junior Vice-Commander, Captain Amos J. Harding; Recorder, Colonel Charles W. Davis; Registrar, Captain Roswell H. Mason; Treasurer, Captain John C. Neely; Chancellor, Colonel William B. Keeler; Chaplain, Chaplain Samuel Fallows; Council, General Walter R. Robbins, Hon. Thomas B. Bryan, Captain William A. Montgomery, Captain Henry V. Freeman, Captain Holmes Hoge.

Missouri Commandery.

Commander, Brevet Major-General John W. Turner; Senior Vice-Commander, Colonel Wells H. Blodgett; Junior Vice-Commander, Assistant Surgeon David R. Porter; Recorder, Captain William R. Hodges; Registrar, Second Lieutenant Franklin L. Ridgely; Chancellor, Captain Francis Raymond, Jr.; Treasurer, Captain John Schenk; Chaplain, Chaplain Samuel J. Niccolls; Council, Colonel Nelson Cole, Major Charles E. Pearce, First Lieutenant Loyd G. Harris, Brevet Major Henry L. Morrill, Major James G. Butler.

Iowa Commandery.

Commander, Captain Milton Russell, Des Moines; Senior Vice-Commander, Adjutant Henry H. Rood, Mt. Vernon; Junior Vice-Commander, Captain Erastus B. Soper, Emmetsburg; Recorder, Adjutant Joseph W. Muffly, Des Moines; Registrar, Captain Fred S. Whiting, Des Moines; Treasurer, Captain Albert Head, Des Moines; Chancellor, Lieutenant Charles W. Fracker, Des Moines; Chaplain, Chaplain Alvah L. Frisbie, Des Moines; Council, Lieutenant-Colonel William G. Cummings, Clinton; Captain Edward L. Marsh, Des Moines; Major Edwin H. Conger, Des Moines; Major Samuel Mahon, Ottumwa; Lieutenant-Colonel George L. Godfrey, Des Moines.

AT the meeting of the Illinois Commandery held on May 10, 1894, the usual appropriation for the purchase of flags to decorate every grave in the Shiloh Cemetery was made. The Illinois Commandery has made it a rule to decorate the graves in the Shiloh Cemetery every year for many years on Decoration Day. Would it not be well for other Commanderies to do the same at some of the other national cemeteries?